

Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again By Eric J. Topol  
**Deep medicine by eric topol** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again  
با تشکر از آرش عزیز که کتاب صوتی این فایل رو برام گیر آورد و بهم اجازه داد صرفاً با پلی کردن و گوش هر چیزی که مرتبط با **Deep medicine by eric topol** ندادن بهش، عذاب وجدان نخوندن این کتاب رو از گردنم بردارم صنعت روباتیک و هوش مصنوعی باشه این روزا این جمله رو توی ذهن مردم زنده میکنه که «به زودی روبات‌های جای پزشکا پروتکل‌ها و سیستم‌هایی که برای هوش مصنوعی طراحی شدن خیلی **Deep medicine eric topol pdf** رو میگیرن محدودتر از این حرف‌ها هستن و برای طراحی هرکدوم مدت زمان بسیار زیادی لازمه تا نتیجه‌ای بهتر از نمونه‌ی انسانی به دست اینطوری نیست که یه نفر بشینه، دیتاهای مربوط به دیابت رو وارد یه سیستم **Deep medicine book summary** بیاد کنه، به اون سیستم آموزش بده و تهش بگه خب، دیگه کسی لازم نیست در زمینه‌ی دیابت به پزشک مراجعه کنه و فقط با این در مرحله‌ی دوم با شناسایی الگوها و یادگیری عمیق این اطلاعات **Deep medicine circle**، سیستم همه‌ی کاراش راه میفته شخصی رو در یک مسیر صحیح برای شناختن درمان یا تشخیص مناسب قرار میده و در بخش سوم با ایجاد یک امپاتی اینکه به صورت سطحی و زودگذر **Deep medicine circle**، صحیح، رابطه‌ی مناسبی رو بین پزشک و بیمار برقرار میکنه علائم بیمار رو مرتبط با یک بیماری بدونیم باعث میشه سالانه میلیون‌ها دلار از بودجه‌ی بیمارارن و سیستم بهداشتی صرف اقدامات تشخیصی و درمانی نامناسبی بشه که هیچ نیازی بهشون نیست و استهلاک ماشین‌های تشخیصی و کمبود برخی کیت‌ها یک یافته‌ی تشخیصی **Deep medicine circle**، توی همین مملکت خودمون این معضل رو چندبرابر بزرگتر میکنه  
Isaac Kohane nicknamed them. غیرمرتبط میتونه بار روانی و مالی بزرگی رو به بیمار تحمیل کنه

## Deep medicine by eric topol

And possible interventions to cure or mitigate the illness. **Deep medicine book summary** کانمن پیشنهاد میکنه هروقت خواستیم یه اندیشه‌ی درست داشته باشیم باید بعد از یه تفکر بدون درنگ، یکمی صبر کنیم، برگردیم و با بخشی از مشکل سیستم درمانی نگرفتن فیدبک **Deep medicine book**، خودمون فکر کنیم، غیر از این چی میتونه باشه. مناسبه، بیماری که درمان میگیره، معمولاً بدون بازخورد مرخص میشه و معلوم نمیشه که آیا درمان مناسب بوده یا نه اگر در طول روز به بیماری با تشخیص نادر برخوردیم، احتمال اینکه در طول روز **Inflamed deep medicine book** کار اینا کمی متفاوته و با **Deep medicine circle**، تشخیص‌های مبتنی بر اون بیماری بذاریم افزایش پیدا میکنه. الگوریتم‌های متعددی سروکار داره که مشارکت هوش مصنوعی میتونه درکنار پزشک، محیط مناسبی رو برای بیکار فراهم کنه وجود سیستمی که بتونه تمام اطلاعات فرد رو جمع‌آوری و متمرکز کنه میتونه به **Deep medicine book summary** از یه جایی به بعد **Deep medicine circle**، پزشک اجازه بده که زمان بیشتری رو صرف شنیدن حرفای مراجعانش بکنه. دیگه نوت برداشتن از کتاب رو متوقف کردم چون پروسه‌ی خوندنش داشت خیلی فرسایشی میشد و زمان زیادی ازم گرفت کتاب پره از مثال‌های متفاوتی از مشارکت هوش مصنوعی توی حیطه‌های مختلفی از **Deep medicine book summary** زندگی ولی نوشتار و متن چندان باب میل نبود و فقط خوشحالم که تمومش کردم ولی احساس میکنم از همین اولش، این حیطه **Deep medicine circle** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again With vast mountains of data generated every day. چیزی نیست که دلم بخواد توش نقشی داشته باشم

## Deep medicine farm

Critics hailed Big Data: A Revolution That Will Transform How We Live Work and Think as a vision of future for big data. **Deep medicine circle** I was mesmerized when I read this line: with the Aipoly app a senior with significant visual impairment can simply point to an object with a smartphone and AI will quickly kick in with a voice response identification. **Deep medicine circle** But on second thought I am not that impressed because it's not a cure — it's just if all you have is a hammer everything looks like a nail — most of the anecdotes mentioned in this book are based on mobile applications because most of the software engineers see the smartphone as the sole solution

to every problem. **Deep medicine acquisition corp** A practical man with little formal education Edison nevertheless understood the value of education but also never missed a chance to show how a clever person could often work around a technical deficiency. **Deep medicine book summary** The mathematician carefully reduced the shape to a complicated equation and then laboriously over a period of hours integrated the equation over three dimensions to get the volume enclosed. **Deep medicine acquisition** When the astonished mathematician asked how Edison had done that the inventor (without saying a word) simply filled the bulb with water and then poured the water out of the bulb into a glass beaker with volume levels marked on the side. **Deep medicine acquisition corp** Like facial recognition software that detects only white faces because the data it was trained on did not contain black faces Deep medicine might inflate bias that already exists in the health care. **Deep medicine acquisition corp** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again Kas tehisintellekt (AI) mille võimet muuta ja kujundada tuleviku on võrreldud elektri ja auruveduriga muudab tervishoiusüsteemi? Absoluutselt. **Deep medicine acquisition corp** Toidame algoritmi andmeid mis puudutavad: inimese sotsiaalseid ja käitumuslike mustreid genoomikat jt 'oomikaid' (transkriptoomika metabooloomika proteoomika jt) immuunsüsteemi mikrobioomi anatoomi keskkonna info terviselugu inimese kõne biosensorite jt andmed mis võimaldab meil saada väga hea ülevaate inimese tervise seisundist. **Deep medicine eric topol pdf** Anda patsiendile mõista et mis ka ei juhtuks on arst tema jaoks olemas ja annab endast kõik et mitte ainult inimest terveks ravida vaid vabastada teda ka kannatusest mis haigusega kaasneb. **Deep medicine book summary** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again As an MD who now works on Healthcare IT field I should start by telling that I am a big fan of Eric Topol and admire his vision in many ways. **Deep medicine book summary** He is giving a nice summary of the current issues in healthcare the current status of AI the update on the AI research related to healthcare its various use in different areas and finally provides a summary of where it might take us. **Deep medicine book summary** But like many others Topol puts all the blame to EMRs and repeats the same mantra of how EMRs are the cause of all burnout and how they are designed for billing not clinical care. **Deep medicine farm** The billing focused EMR is a thing of the past - like 20 years or so and those days are long past but it is an easy target so everyone use the same mantra rather than acknowledging the complex issues around healthcare its finance lack of appropriate and wide coverage primary & preventive care the policies rules regulations and finally IT. **Deep medicine book summary** ( As an anecdote in my first EMR implementation job in the US I was shocked to find out that the private practice I was working with was scheduling doctors so they see two patients at the same 15 min interval. **Deep medicine circle** ) I would anticipate a more balanced approach from Topol about EMRs for example pointing out couple of benefits of EMRs in addition to the challenges they provided and was disappointed to read his bias over and over. **Deep medicine book summary** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again Though this is a AI book---algorithms---just because AI can drive a car better than you is not a reason why it should take over driving. **Deep medicine book summary** Topol Though I cannot attest to a 7 minute visit I can say in certain areas this is all that can be afforded by the overwhelmed physician in a place where demographics prevent them from administering proper care. **Deep medicine circle** The Doctor patient relationship is sacrosanct to health as It is more important to know what sort of person has a disease than to know what sort of disease a person has---Hippocrates. **Deep medicine circle** Some characteristics of the human condition that AI cannot accomplish are empathy human touch love laughing crying telling stories jokes generosity and intuitiveness to the needs of a human being. **Deep medicine pdf** For someone with little knowledge about AI like myself it gives a quick overview of AI in what sectors AI tools are being used and then proceeds to talk about its application within different branches of medicine but also within other related areas such as drug discovery omics and mental health. **Deep medicine farm** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again One of America's top doctors reveals how AI will empower physicians and revolutionize patient care Deep Medicine: How Artificial Intelligence Can Make Healthcare Human AgainWell researched

insufficient time insufficient context and insufficient presence. **Deep medicine circle** "To be a good diagnostician a physician needs to acquire a large set of labels for diseases each of which binds an idea of the illness and its symptoms possible antecedents and causes possible developments and consequences granular the medical profession is ripe for the application of deep learning to transform its very landscape. **Deep medicine circle** From bringing precision medicine to life to improving the utility of electronic health records systems the potential of AI to improve medicine for doctors and patients alike is extraordinary. **Deep medicine eric topol pdf** The potential disruptive changes this might bring are also considered in the book particularly with regards to the cries that we should stop training all radiologists now - Topol suggests that new generations of radiologists will work more as scan specialists who work in tandem with AI to read pathological slides as well as MRIs X-rays and CT scans. **Deep medicine book summary** He reminds us that AI may not just be able to build upon what is good and can be made excellent; it can also help to fix the problem areas in medicine that have crept in over the years in particular time spent with patients. **Deep medicine book summary** Topol suggests that AI could help to maximise doctor patient interactions by streamlining a lot of the various administrative processes that a doctor might have to attend to during a consultation. **Deep medicine book summary** Five months ago I started working in healthcare AI with zero background in AI/ML (but fortunately I don't need a background in AI for my role as I'm not on the tech side). **Deep medicine book summary** Topol does an amazing job at breaking down really complex concepts and explaining it in very easy-to-understand ways so it becomes extremely accessible to the reader while also showing why robots won't take over all our jobs. **Deep medicine book summary** I also geeked out a little bit when he mentioned some medical education work (like the role of humanities and art appreciation in diagnosis) because that has been a significant area of focus for me in my PhD work. AI is the future of medicine and I think we need to embrace it and make sure that patients get the most out of it. **Deep medicine acquisition corp** 3>It's no wonder that we have an opioid epidemic when it's a lot quicker and easier for doctors to prescribe narcotics than to listen to and understand patients, **Deep medicine book summary** اولین ماشینی که هر بیماری ای **Deep medicine farm** افتادم Elysium یاد فیلم AI بار و بدون هیچ مطالعه‌ای با شنیدن کلمه‌ی همینکه به نفر بتونه فقط و فقط برای **Deep medicine by eric topol**: رو درمان میکنه و براش فرقی نداره که داستان چیه چیز **Deep medicine farm** تشخیص دیابت و اونم تو یه جمعیت با ویژگی خاص یه شبکه طراحی کنه خیلی هنر کرده **Deep medicine** نامیده میشه Deep medicine که امروزه داریم ترکیبی از همکاری هوش مصنوعی و پزشکان انسانیه که پزشکی عمیق قادره که هر انسان رو به صورت منحصر بفرد و جداگانه، براساس تمام اطلاعات ژنومی **book summary** )))=پس همه چیز اونقدرها هم قرار نیست روباتیک باشه **Inflamed deep medicine book**: مربوط به اون بررسی کنه **Deep medicine acquisition** patients exist in a world of insufficient data.

## Inflamed deep medicine book

A world of shallow medicine, **Deep medicine acquisition** درمقابل پزشکی عمیق، معضلی به اسم پزشکی **Deep medicine by eric topol** سطحی حتی مدعیان پیشرفت در خدمات درمان و سلامت رو درگیر خودش کرده **Deep** طبق مدل کانمن ما دو مدل فکری داریم، یکی سریع و بدون فکر و دیگری آهسته و آگاهانه DANIEL KAHNEMAN— **Deep medicine book summary** همین نبودن بازخورد مناسب در گذر زمان باعث افزایش اعتماد به نفس میشه **Deep medicine book summary** از طرفی دیگه ما با خطایی به اسم «در دسترس بودن» سر و کار داریم **Deep medicine farm** مشکلی که در رابطه با **Deep medicine by eric topol**، پلتفرم‌های مختلفی برای تشخیص و درمان طراحی شدن ممکنه حس درد رو **Deep medicine eric topol pdf**، اینها وجود داره اینه که علائم بیمار همیشه صفر و یکی نیستن **Deep medicine circle** A computer reading a scientific paper requires human oversight to pick out key words and findings: **Deep medicine farm** بخشی از پزشکان، یعنی کسانی که رادیولوژیست، پاتولوژیست و درماتولوژیست نیستن رو میشه تحت

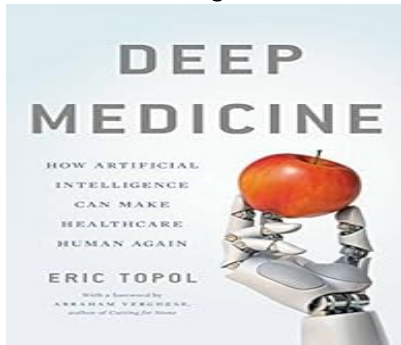
نامگذاری کرد Pattern عنوان پزشکان بدون **Deep medicine circle** We have trapped ourselves in a binary world of data interpretation—normal or abnormal—and are ignoring rich.

## Deep medicine circle

And continuous data that we could be taking advantage of: **Inflamed deep medicine book** باید توجه خیلی از نرمال‌هایی **Deep medicine book summary** داشت که امروزه خیلی چیزها به صورت صفر و یکی بیان میشن مثلا نژاد و شرایط **Deep medicine book summary** که نوشته میشن چندان ه اختصا صیت راجع بهشون فکر نشده فعلا دلم میخواد چندتا کتاب بوجی بوجی و بدون اساس **Deep medicine farm**: زندگی فرد درشون دخیل دونسته نشده **Deep medicine book** Take IBM Watson for example IBM Watson still hasn't delivered much in health care. **Deep medicine circle** )We have seen the mess created by move fast and break things philosophy. **Deep medicine circle** The way I see it Deep medicine might be the move fast and break things in health care, **Deep medicine circle** Certainly Artificial Intelligence will provide a helping hand in health care: **Deep medicine by eric topol** Take diabetic retinopathy the number one global cause of vision loss: **Deep medicine book summary** If all the recommended screening of people with diabetes was performed there would be well over 30 million retinal images per year that would need to be evaluated. **Deep medicine circle** Since most startups are aiming to use smartphones as a diagnostic tool it might result in overdiagnosis, **Deep medicine eric topol pdf** Artificial intelligence cannot replace actual science it can help speed things up it is a complimentary tool but it can never be a replacement for actual science. **Deep medicine book summary** It reminded me of an anecdote told of the great American inventor Thomas Edison: **Deep medicine circle** For example after hiring a young mathematician Edison assigned him the task of determining the volume of a new lightbulb a bulb designed with an undulating shape. **Deep medicine acquisition** Edison congratulated the man on being a fine mathematician as his computed answer agreed quite well with Edison's own value which he had arrived at in less than 30 seconds: **Deep medicine circle** Edison had made his point: math is great but use it as a tool and not as a crutch. **Deep medicine book summary** Same with artificial intelligence: we should definitely use it as a tool but not as a crutch: **Deep medicine acquisition corp** And finally like all things pertained with the information age there is the issue of privacy: **Deep medicine book summary** Arvestades isegi asjaoluga et rahvastik vananeb eeldused tervishoiukvaliteedi osas suurenevad ning uute ravimite maksumus hakkab al 100 000\$? Jah, **Deep medicine circle** Ühiskonnana oleme leiutanud väga võimsa tööriista mis on võimeline leidma tohututest andmemahtudest seaduspärasusi milleks ükski inimene võimeline pole: **Deep medicine book summary** Alustan lihtsamatest näidesest ja hakkan suurendama vajaminevaid andmemahtusid. **Deep medicine acquisition corp** Aktiivsusemonitor detekteerib südame löögisageduse tõusu ilma et inimese füüsiline aktiivsus oleks tõusnud. **Deep medicine pdf** Palub koheselt teha inimesel EKG (elektrokardiogramm) detekteerib südame rütmihäire: **Deep medicine book summary** Toidame algoritmi kümneid tuhandeid EKG-d AI leiab seaduspärasusi mille alusel on võimalus mitte-invasiivselt määrata inimese kaaliumi taset, **Deep medicine book summary** Toidame närvivõrgustikku inimese DNA ning leiame seoseid geenide ja haiguste (nt autismi diabeedi Alzheimeri jt haiguste vahel) vahel: **Deep medicine farm** Kuid peamine mis me selle andmestikuga teha saaksime on muuta inimese käitumist et vältida haiguste teket. **Deep medicine book summary** Üheski eelnevast andmestikust ja tehnoloogiast ükski ei ole kasu: **Deep medicine book** Tehnoloogia ja arsti koostöös on võimalik vähendada raviüksimusi ja parandada teisi olulisi ravikvaliteedi näitajadi: **Inflamed deep medicine book** Võttes arstilt vajaduse sisestada andmeid digilukku vabastades sellega peamist ressursi mida napib ja mille tõttu ~50% USA arstidest on läbipõlemise sümptomeid: **Deep medicine eric topol pdf** Tänu sellele saavad arstid teha seda milles me oleme head - olla inimesed. **Deep medicine acquisition corp** I read his previous books follow him on twitter and watched him live multiple times in various events, **Deep medicine pdf** When I was a TED translator I translated couple of his TED talks to Turkish (

and he even acknowledged it in a signed book when I met him): **Deep medicine book summary** So I started to read this with a huge positive bias obviously. **Deep medicine book summary** Things disappointed me was to see the same cliché reasoning around the EMRs: **Deep medicine circle** Yes physician burn out is a big problem and we should be worrying about it and should try to find solutions to remediate it, **Deep medicine by eric topol** Now as a person who works in this field I can attest that the latter is not true at least not anymore. **Deep medicine acquisition corp** The first claim - EMRs being the cause of all burnout is also dubious in my opinion. **Deep medicine book** I am sure they do have an impact and definitely it is a factor that impacts patient/provider interaction, **Deep medicine circle** However there are other causes like regulations the monetary healthcare system fee for service and faulty incentives. **Deep medicine acquisition** When they were doing this they were on paper and had no EMR at all. **Deep medicine book summary** I could not even wrap my brain around how a doctor can see two patients in the same 15 minutes and advised against it. **Deep medicine book summary** So no it was not the EMRs who disconnected the patients from doctors it was the healthcare system itself. **Deep medicine book summary** And please do not tell me that providers were able to prep and chart properly for those patients they saw on average of 7. **Deep medicine circle** The second drawback for me was the endorsement of couple new healthcare tech companies with dubious claims. **Deep medicine circle** He did the same thing in his previous book The patient will see you now about Theranos. **Deep medicine book summary** He told how amazing this technology and how impressed he was for pages. **Deep medicine circle** He does the same thing for two new companies DayTwo and Viome and in a similar way promotes a pretty ambitious claim that is yet to be proven and accepted. **Deep medicine circle** Both companies are in search of more investors and the scientist are vary of wild claims made by these kinds of startups: **Deep medicine book summary** So it was a real turn off for me when I read an almost advertorial promotion of those similar to what he did for Theranos. **Deep medicine eric topol pdf** These two issues made me deduce two stars since I felt there was a certain bias in some of the issues and how they are being narrated: **Deep medicine book summary** Other than these two I think it is a good compilation of AI and its use in the industry and it's potentials. **Deep medicine book summary** I especially liked the section on AI Applications on Mental Health: **Deep medicine book summary** Definitely a must read for those who are interested in AI Medicine and Health Informatics: **Deep medicine by eric topol** There is a reason of course to see your physician (though this is becoming increasingly difficult) given the burden on healthcare practitioners today: **Deep medicine circle** Face to face or Telehealth visits are a substantial part of wellness and care, **Deep medicine book summary** Topol (Cardiologist) who states the average physician spends 7 minutes per patient. **Deep medicine book summary** AI can revolutionize other aspects of our lives that are in one sense or another upstream from the clinic: **Deep medicine by eric topol** One of the unexpected and practical accomplishments of machine learning to date has been to provide a potential scientific basis for individualized diets, **Deep medicine farm** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again A very up to date and well researched book on the world of AI and its application in medicine, **Deep medicine book summary** At the same time he also touches on issues of empathy in medicine and the patient-doctor relationship: **Inflamed deep medicine book** we can choose a technological solution to the profound human disconnection that exists today in healthcare. **Inflamed deep medicine book** Unfortunately the book feels somewhat choppy at times feeling more like a collection of essays than a cohesive book: **Deep medicine acquisition** However I don't think that this is a significant problem; the separation allows Topol to compartmentalise his thesis into its various subsections quite effectively, **Deep medicine pdf** It's a pertinent reminder that medicine is inherently a human enterprise and that should not be forgotten in the pursuit of optimisation with deep learning: **Inflamed deep medicine book** To cure sometimes to relieve often to comfort always Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again One way to describe modern medicine is shallow: **Deep medicine acquisition corp** This book explores how AI would actually deepen in and how we should not be afraid of what it can bring to the table, **Deep medicine circle** Deep Medicine: How

Artificial Intelligence Can Make Healthcare Human Again I really enjoyed this book. **Deep medicine eric topol pdf** I'm learning a lot about it naturally through working around AI engineers physicians researchers IT folks data scientists etc: **Deep medicine circle** but I'm trying to accelerate my learning as much as possible: **Deep medicine book summary** I picked up this book after someone in a meeting mentioned it: **Inflamed deep medicine book** So I appreciated the diversity of experiences within medicine that he managed to work into his narrative: **Deep medicine circle** It is interesting to see even in the last few years how much progress has been made too as some of the things he mentions in the book have already evolved rapidly: **Deep medicine circle** This is the book I'll give someone if they ask me what I do for a living: **Deep medicine farm** Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again



[1]

Eye-opening and fascinating. کنسر؟ مشکلی نداره. پسونبازیس؟ درمان میکنیم. آب حوض؟ میکشیم.» اما این فعلا در حد یه شوخیه. But a lot of it turned out to be hype. I see the same hubris in health care AI. (<https://spectrum.ieee.org/biomedical/>. Clearly this sounds like a job for deep learning. Then he proudly showed the result to Edison. A gold mine is only as good as the man digging. Artificial intelligence depends on good unbiased data. Kas AI-l on võimalus vähendada tervishoiukulutusi? Absoluutselt. EKG läheb arstile patsient saab varakult arsti juurde. Arst määrab vajadusel ravimid. Eluliselt oluline näitaja neerukahjustusega patsientideke. Suurendame andmemahtusid veelgi. Arvestades seda ravida haigust personaalsel tasemel. Kindlasti ei kao arsti roll kuhugi. AI kindlasti muudab arstitööd. See ressurs on aeg. Olla empaatiline. Olla hetkes. Tunda kaasa. Kuulata. I liked the book overall. 5 minutes each when they were on paper. They weren't and the only difference is that nobody knew. Now it is all in the open. And we all know how Theranos ended up. But read it with a grain of salt from time to time. It's not about the competition of the human vs. the robot yet more of a collaboration between the two. Dr. Eric J. Topol's outlook is to make healthcare human again. A huge one is how we eat. ---Dr. Eric J. Or as I say "incidentalomas. It's wonderful. Super fascinating