

## How a Teaspoon of “Exponential Growth” Learning Can Help Keep the Doctor Away

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David Sheon | September 4, 2014

A certain doctor of mine, who shall remain nameless, refuses to use anything but the fax machine to communicate with his patients when they are not in the office. Need a copy of your invoice with his name, license number, and the billing codes for service? His office is happy to fax or mail it, but if you want it scanned and sent by email you're out of luck.

How 1994 is that?

If exponential growth trends in medicine hold true, the doctor's office that refuses to keep up with technology will have little choice but to close its doors. In this post, we'll take a close look at exponential medicine and the growth model behind it. Most of the new technologies includes instantaneous transfer of data for medical records or to otherwise benefit patients. We'll take a look at some examples of the future of medicine derived from advances in hand-held technology.



Week in and week out, RealWorldHealthCare.org focuses on advances in healthcare delivery that improve patient outcomes. But when we're looking at combining healthcare with technology, it's important to understand a concept called Moore's law. Named after Gordon Moore, co-founder of the Intel Corporation, Moore's law is the observation that, over the history of computer hardware, the number of transistors in a dense integrated circuit doubles approximately every two years. Similarly, cost is cut in half in about the same period. Moore's law has been used successfully to accurately help predict the timeframe for advances in artificial intelligence, biotechnology, nanotechnology, medical apps, and other computer assisted technologies.

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Did you know that September is Childhood Cancer Awareness Month? One way to help pediatric cancer patients and their families who are faced with a devastating medical emergency is to donate to HealthWell Foundation's Pediatric Assistance fund. [Click here](#) to learn more and donate to help families in need.

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Understanding the implication of doubling every two years within medical technology requires understanding that many real world phenomena can be modeled by understanding exponential growth. Think of phenomena such as the growth or shrinking of populations, bacteria and viruses such as HIV/AIDS, radioactive substances, electricity, or temperatures impacted global warming.

Activities that evolve by a fixed percent at regular intervals exhibit exponential growth. This is different than our typical linear concept of growth. If you were asked to walk 30 steps out your front door, even without walking an inch you'd have a pretty good idea of where you'd end up standing. But take 30 exponential steps so that first you walk one step, then two, then four, then eight and by the 30<sup>th</sup> exponential cycle, you will have walked over a billion steps from your front door.

One example of Moore's law and exponential growth is that the typical smart phone today has as much computing power as [all of NASA had in 1969](#). And it's built at a tiny fraction of the 1969 cost to NASA.

So where is exponential growth taking medical apps?

How about [GE's new handheld Vscan](#), which can deliver high quality ultrasound easily and send the file directly to a patient's electronic medical record so that it can be pulled up by any doctor at any hospital, any time you come in?

Looking to make sure you are staying compliant with your asthma treatment? The [Assist Me, by Use Inhalers App](#) has you covered. Your doctor will learn whether you are using the inhaler as frequently as you should.

Would you like to have inexpensive real time heart monitoring, with your heart rate, blood pressure, and pulse rate sent directly to your doctor so that on your next visit she can offer medical advice based on long term data? [AliveCor](#) turns your Android or iPhone into an FDA cleared device for that purpose.

"Today, healthcare is in many ways being practiced as it has been for millennium -- as 'SickCare' -- using old, reactive models and mindsets where the FAX machine is still the primary mode of sending patient information, where data is still silo'd amongst paper charts or rudimentary EMRS, and feedback loops between clinician and patient are broken or limited," says Daniel Kraft, M.D., Conference Chair of Singularity University's [FutureMed](#) program, which gives a front row seat to those interested in seeing the next exponential step in medical technology. "But we are living in a fast moving, exponential age, where the convergence of rapidly developing technologies are enabling vast new capabilities with the potential to radically improve and disrupt the future of wellness, prevention, clinical practice and to address many of the grand challenges facing the healthcare and biomedical industry across the planet."

If medical technology can communicate so instantly and successfully with us, then there is no reason that doctors can't be more responsive using more current technology to communicate with patients.

Does your doctor still rely on 20 year old technology to communicate? Have you tried wireless disruptive medical technologies? Tell us about your experience!

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