

# Information management and healthcare.

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**Issue 4 (2014):**

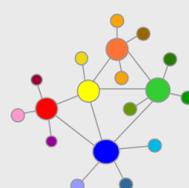
**Electronic Health Records** (ODO001/003/04/2014 )

Issue 5 (2014):

The Protection of Personal Information Act

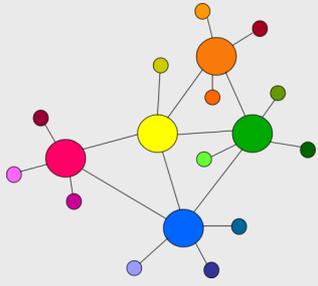
Issue 6 (2014):

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# Synapse

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ODO001/003/04/2014

1 clinical, 2 ethics CPD points

The right to privacy in the sphere of health-care has recently been brought under the spotlight by several unrelated, but contributing developments:

1. USA healthcare policy has embraced electronic health record (EHR) systems in an effort to curb spiralling healthcare costs.
2. The *Protection of Personal Information Act* was signed into law by the president of South Africa, and gazetted in November 2013.
3. Internet and communication technology is growing by leaps and bounds, together with portals where we easily share a great deal of personal information. What are the implications for privacy, particularly in healthcare?
4. The information age has proven to be a double edged sword: Patients and practitioners are bombarded with too much information, yet struggle to access pertinent, accurate and reliable information.

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### Please note

The case(s) in this series are fictitious and have been invented to illustrate how modern practices and technology can benefit patients, or pose a potential threat to their rights. The clinical information and references, however, are completely accurate. Each article is complete. It is recommended, but not essential, that you do issues 4, 5 and 6 in sequence.



### Meet Mrs Rattanakosin

In the next 3 articles we will get to know more about her as we interrogate principles such as the patient's right to privacy on the one hand, and the right to enough information to validly consent to treatment on the other. How do these issues impact our aim to practice evidence based healthcare?

This first in the series of 3 articles looks at electronic health records (EHRs) and the ethical challenges they may pose.

## Electronic Health Records: Friend or foe?

Let's set the scene:

**Place:** Your practice

**Time:** A Monday morning

**Date:** The near future

Meet the Rattanakosins: The very charming Mr Rattanakosin recently visited your practice. He is on a 6 month contract from a large corporate in Thailand to oversee the opening of a branch in South Africa. His company supports the Thai banking industry. His English is as impeccable as his manners. His mother, Mrs Rattanakosin (aged 78) is visiting from Thailand. Over the weekend she noticed vision loss and Mr Rattanakosin has phoned first thing on Monday morning to request an urgent appointment. He will send his chauffeur to bring Mrs Rattanakosin. She doesn't speak much English but, says Mr Rattanakosin, she is a HealthWeb member and that will be of great assistance.

Before Mrs R arrives, you download the HealthWeb app on your smartphone and tablet. She places her finger on your smartphone screen, confirming her identity by fingerprint and thereby accessing her electronic health records in a cloud-based information bank with a health management system head-officed in Switzerland. Mr R has already visited the patient portal and entered 'sudden blindness' into her records so the system now suggests a general battery of emergency eyecare questions in Thai, and it will translate Mrs R's answers into English. You install Mrs R comfortably in the accounts department with the tablet where she can quietly get on with answering the questions.

HealthWeb allows you to access useful data from her last eye exam, including spectacle Rx and corrected VA, IOPs, fundus photos, pachymetry and OCT. Her detailed account is available: Frame make and model, multifocal lens description (fortunately all brands and models are familiar to you and available here) and you notice with interest the difference in price between South Africa and Thailand.

**Reminder**  
Click on the coloured, underlined words in the text for source documents and further information.

The system shows all search results in [Thai](#) and offers to translate to 17 different languages. There is a facility to type words, phrases or questions in English which will be translated and addressed to Mrs R in Thai either in text or by voice synthesiser. Trouble is that Mrs R struggles a little to understand the Bangkok dialect and pronunciation. She uses Siamese Thai. Of course, she doesn't see very well so the pretty, [curly text](#) on the screen makes almost as little sense to her as it does to you.

Access to her complete healthcare records is also available, provided you agree to a disclaimer acknowledging that the information provided may not be accurate and you assume sole and personal responsibility for decisions taken based on this information. You consent by entering your registration number and the site automatically checks your compliance with local regulatory bodies such as the Health Professions Council. Non-registered persons or those behind on their CPD requirement are blocked from accessing patients' medical information. Your query is also logged so that subsequent care providers can see that the patient has accessed her data via your practice. Your insurer is notified that you are seeing foreign nationals and they flag it as a potential increased risk, which may impact on the cost of your indemnity insurance.

Mrs R (according to the site) is diabetic and on glibenclamide. HealthWeb informs you that this is an oral hypoglycemic agent, and having automatically checked your GPS location via your smartphone, tells you that it is called Daonil in South Africa. The system now directs you to a local website and once again, there is a disclaimer. The link is to the [SA Electronic Package Inserts](#) website (a very useful site, by the way!) which explains that [Daonil®](#) is a sulfonylurea and that side effects include 'skin rashes, photosensitivity, diarrhoea, nausea, vomiting, epigastric pain, feeling of gastric fullness, dizziness, headache, weakness, fever, hypoglycaemic reactions and paraesthesia. Eosinophilia, cholestasis, hepatitis, jaundice, blood disorders including leucopenia, thrombocytopenia, aplastic anaemia, pancytopenia, haemolytic anaemia and agranulocytosis' may also occur. Phew!

Transient visual disturbances may occur at the commencement of treatment.

Adjustment of dosage of Daonil may be required in patients suffering from recurrent infections, trauma, shock or after anaesthesia. When major surgery is to be performed, Daonil should be substituted with insulin therapy.

Intolerance to alcohol may occur and if the drug is taken at the same time as alcohol, there may be either a potentiation or an attenuation of the hypoglycaemic effect. (The system lists Mrs R's religion as Hindu, and you wonder whether the Hindu religion forbids alcohol. The question facility redirects to [Ask.com](http://Ask.com), where most of the answers suggested have been flagged as 'spam.')

The hypoglycaemic effects may also be enhanced by: chloramphenicol, clofibrate, halofenate, cyclophosphamide, dicoumarol, monoamine oxidase inhibitors, salicylates, phenylbutazone, propranolol and other beta-adrenergic blocking agents, sulphonamides, anabolic steroids, bezafibrate, biguanides, fenfluramine, fenylramidol, miconazole, parenteral pentoxifylline in high doses, phosphamides, ACE-inhibitors, fluoxetine, guanethidine, probenecid, reserpine, sulphinpyrazone, tritoqualine and tetracyclines. Is there anything that **doesn't** interact with it?

The hypoglycaemic effect may be diminished by adrenaline, oestrogens, corticosteroids or diuretics, abuse of laxatives, high doses of nicotines, phenothiazines, acetazolamide, clonidine, diazoxide, glucagon, phenytoin, saluretics, sympathomimetics and thyroid hormones. Propranolol may inhibit normal physiological response to hypoglycaemia and mask the symptoms of hypoglycaemia...'

Back to Mrs R's electronic health records: Her last visit to her general practitioner was 8 months ago when her random blood glucose was 6 mmol/l and her HbA1c 6.6%. The system confirms that Mrs R is not known to have a sulfa allergy but nevertheless reminds you that Stevens Johnson Syndrome (SJS) can result from sulfa drugs and helpfully lists some of the usual suspects: [allopurinol](#), [valproate](#), [levofloxacin](#), [diclofenac](#), [etravirine](#), [isotretinoin](#), [fluconazole](#), [valdecoxib](#), [sitagliptin](#), [oseltamivir](#), [penicillins](#), [barbiturates](#), [sulfonamides](#), [phenytoin](#), [azithromycin](#), [oxcarbazepine](#), [zonisamide](#), [modafinil](#), [lamotrigine](#), [nevirapine](#), [pyrimethamine](#), [ibuprofen](#), [ethosuximide](#), [carbamazepine](#), [bupropion](#) and [nystatin](#).

Generally antibiotics such as the [sulfonamides](#) and [penicillins](#), barbiturate sedatives and [phenytoin](#) (an anticonvulsant) are the ones to watch out for. HealthWeb requests that you remind Mrs R of the risk of taking the medication, particularly since she has now been identified as being positive for the HLAB75 gene marker

which (in East Asians) is strongly associated with carbamazepine and phenytoin induced SJS. She's not on these, remember, she's on glibenclamide, but it doesn't say whether there is a relationship with glibenclamide induced SJS. Having never dealt with a SJS case before, but vividly remembering nasty text book images, and having had no exposure to human leucocyte antigen (HLA) typing since Physiology 101, you refer Mrs R to a physician for further testing and for an explanation of her HLA typing.

SJS can strike at any time, but is more common when patients first start taking the medications. Since Mrs R has been on glibenclamide since 2008, SJS is an important, but unlikely contender so the visual disturbances mentioned in the drug side effect list can probably be ruled out. According to her electronic health records, Mrs R is not only diabetic, but has also recently been diagnosed with Parkinson's, for which she is taking amantadine. Again, the website helpfully mentions that amantadine is branded Symmetrel in South Africa but the [South African Electronic Package Inserts](#) website draws a blank. Having identified your GPS location as South Africa, the system blocks you from trying to access foreign sites. This is part of the user agreement and is aimed at preventing overprescribing and subsequent drug addiction. All your searches on the system frustratingly and consistently direct you back to the local site. So, to Google for answers then. One of the hits is a [list of medications](#) that may cause glaucoma:

- Steroids – oral, topical or local.
- Anti-depressants: Tricyclic, monoamine oxidase (MAO) inhibitors (eg. phenelzine) and selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine may all cause a narrow angle to close.
- Oral antihistamines and decongestants e.g. those containing diphenhydramine, pseudoephedrine and phenylephrine) which cause slight pupil dilation and can close a narrow angle.
- Botox, diffusing back to the ciliary ganglion and inhibiting the pupillary sphincter. (Had no idea – must store that somewhere in the brain for future reference.)
- Anti-psychotic medications e.g. chlorpromazine and thioridazine.
- Anti-Parkinsonism medications e.g. levodopa and amantadine – bingo!

Via animated [sign language](#), you gather that Mrs R has not taken any other oral medications, has no idea what botox is but can wrinkle her eyes and forehead and has not used any other drops. Has the amantadine caused an angle closure?

Just then, several warnings flash ominously on the screen: Having failed to collect her Parkinson's or her diabetes medication as prescribed from her allocated healthcare centre in Thailand one month ago, Mrs R has been flagged as non-compliant. The system urges you to visit a [Joslin Diabetes Centre](#) site detailing the complications of uncontrolled diabetes and requests that you counsel the patient about compliance. Joslin, a prestigious medical facility based in Boston & specialising in the management of diabetes, refer to blood glucose in mg/dL or milligrams per decilitre rather than our mmol/l. Fortunately, a site that converts between the two units of measure is [just a click away](#) but working in units that you are not accustomed to is cumbersome and feels inefficient.

Because 'sudden blindness' has been entered as the reason for accessing Mrs R's data today, HealthWeb has cross referenced her history with her:

- Age
- Grocery purchases (all her credit card grocery purchases are tracked and analysed to reward her for making healthy choices – a new initiative of the bank her son is working with – so her health care insurer infers her dietary habits from these purchases)
- Lifestyle habits such as smoking (Mrs R buys her elderly father tobacco every week) and exercise patterns (Mrs R is an avid yogini – a woman who practices yoga – and teaches classes at home 3 days a week. Her health insurance includes free membership to a gym, which she has not accessed and hence she has been classified as sedentary)
- Medications prescribed (and collected, presumed used)
- Genetic information (Mrs R's daughter, who lives in LA, gave her a [23andMe](#) voucher for her birthday last year. This info has been added to her EHRs.)

Based on the information available, the comprehensive electronic health record system warns that Mrs R has almost certainly suffered either an angle closure attack (brought on by the amantadine) or a diabetes-related ocular calamity. If a computer could panic, it would be panicking.

Meanwhile, the clinician's panic has a slightly different focus. It's been 20 minutes, the next patient has arrived and this consultation hasn't even started yet! It has been a wonderfully informative session with a computer but we are no nearer a definitive diagnosis than we were before Mrs R gave us her fingerprint.

Let's examine the patient. Due to the language issues, we'll focus on objective testing. Also, we're running out of time!

Her pupils are equal, round and reactive to light. Motilities are full and smooth.

Her habitual Rx is around -4.50 DS OU with which her distance VA is 6/18. Your retinoscopy Rx is about -5.50 DS and you notice significant lens opacities, especially L.

Corrected VA is R: 6/7.5 and L: 6/9.

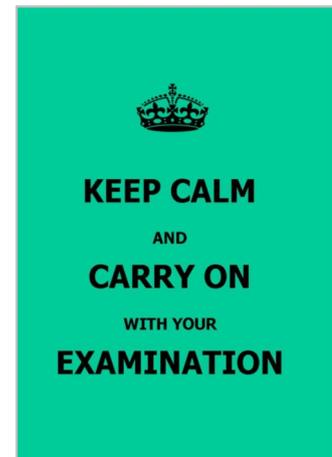
Her angles are open, IOPs both 16mm Hg OU and neither slitlamp fundus exam nor fundus photographs reveal any diabetic retinopathy. You tell Mrs R that all is probably well and that you will explain to Mr R in detail as soon as he's

available to discuss. Explaining myopic shift secondary to early cataracts is probably best not attempted without a competent translator.

Mr R phones later in the afternoon and you manage to fill in the many gaps: He and Mrs R had visited a nearby game reserve over the long weekend and she had been unable to spot the kudu that he was pointing out. She did not recall struggling with her distance vision before and was immediately concerned. It often happens that patients think a symptom had a sudden, recent onset when actually they only recently noticed it. Sometimes it's clearly an old lesion but if not, it may require a fair bit of investigating to confirm that the condition is stable and long standing. Err on the side of caution, but also trust your instincts in such cases.

Mrs R, while quite fictitious, is perfectly possible. HealthWeb does not exist either, but it, or something like it, inevitably will. This scenario was created to illustrate the fallibility of data management systems. Even without data capturing errors, i.e. even having entered the 'correct' information, the outcome is far from ideal.

Mrs R could have received a repeat prescription for her meds while travelling and be perfectly well controlled, yet she is on record as having not collected her



medications timeously. In fact, she tried to collect them before her trip, but the clinic pharmacy's EHR system prevents them from supplying more than 3 months' meds at a time. Some points to ponder:

- Mrs R has been classified as irresponsible, sedentary and as a smoker while she is none of these.
- Mrs R thinks she is a walking time bomb and her angles may close at any moment because of her genetic make-up and her medications. Will she keep taking her meds or will she start skipping to reduce her 'risks' of side effects?
- Mrs R seems unaware of who has access to her health information.

Systems designed to improve patient care are getting better and better. IBM's supercomputer, Watson, has gone to medical school and can now combine the entire career experience of thousands of clinicians across various specialties. Soon, I suspect, we will be able to submit clinical details to a computer which will return statistical probabilities (with supporting literature) for all of the courses of action open to us.

A useless fact, just because I like trivia, is that

Watson was not named for Sherlock Holmes' trusty sidekick, Dr Watson, but for Thomas J Watson, founder of IBM. He was also the creator of IBM's motto: THINK Teaching the computer Watson to **think** is exactly the challenge, says IBM research director, John Kelly. How do we (or Watson) get through the mountain of data and research available to guide our clinical decisions?

Computer-based systems will probably always have flaws, and those flaws may result in irritation, worry or unnecessary risk and expense to provider and patient. We would probably not have referred Mrs R had the computer not flagged her risk for angle closure glaucoma based on her HLA type and her medications. The HPCSA's regulations prohibit advertising that causes unwarranted anxiety that a patient may be suffering from any health condition so they may take a dim view of an EHR system causing alarm where there was probably no cause. Yes, Mrs R could very well have had a closed angle but we know how to identify narrow angles and we should be looking (at least with Von Herrick) at every patient's



IBM won gold at the 2012 London International Advertising Agency Awards.

angles anyway. Even when you have no language in common with a patient, do the most accurate, systematic examination possible. Without speaking a word we can identify the cloudy cornea and elevated IOP of a closed angle. We may even have managed gonioscopy without much explaining.

### Access to healthcare information

[Jeff Drazen asks why](#) our healthcare data is not as easily accessible abroad as our money is. If one can draw money as easily from an ATM in Reykjavik as in Rivonia with your bank card, why not access your medical information in the same way? For one, a prescription may be useless to an automated or computerised dispenser because we have failed to standardise international proprietary drug names. Just thinking of an example of a drug class that may be required by a traveller with allergic conjunctivitis: Epinastine is called *Elestat* (US) or *Relestat* (UK, SA) and ketotifen is *Zaditor* or *Zaditen*. We would have to revert to the generics to be accurate.

There are some flaws in Drazen's case: We can draw money abroad fairly easily when we have the access key (a bank card) but what if you lost that? Have you tried to replace a lost/ stolen/ destroyed card while on holiday? Or draw money without one? Despite claims to the contrary, I know from experience that there's nothing international about an American Express card, and one can not get a replacement at the American Express office in Paris. Without a locally recognisable key (a card, or for medication, a universal Rx) we would not be able to access the medications we need. Imagine if an international repository for banking information were available, and that information gave subscribers from Copenhagen to Calcutta access to my actual funds, would I trust them with my information? I would want to know who has my financial information and how they are storing it. [Bitcoin](#) was meant to be such a currency, but has had its own challenges. Just recently the Tokyo-based exchange [Mt.Gox](#) has frozen withdrawals. A [Bitcoin software glitch](#) may have allowed thieves access to Bitcoins, and Mt.Gox has been unable to fix the problem. Security has become critical as more aspects of our lives move online. And if I'm not prepared to give my valuable information to a bank, why would I post personal and health information with a third party?

Actually, many of us do it all the time.

We post on Facebook.



## The dark side of holding data

TED Talks has a series of 11 videos that reveals how much information about us is already held by others, and how that affects our privacy. After [Malte Spitz](#) discovered that his cell phone company was tracking his phone calls and his movements (via his phone's GPS), it took a law suit for him to get access to his own information! Even after his contract with the company ended and his bills had been settled, the company retained this information about him. What if your information was accessed while being kept by the phone company? What if your predictable daily routine falls into the hands of burglars, or your spouse stumbles onto evidence of an indiscretion?

Alessandro Acquisti ([TED talk no 5](#)) has a compelling argument for more careful management of our own information.

In summary: There is no doubt that biometric identification could solve many problems and that having access to medical records may

help us provide better care, provided the information is correctly

managed. Acquisti mentions protective mechanisms such as transparency requirements and national legislation. What protection do we have and how can we protect our patients? The *Protection of Personal Information Act* – or POPI Act – was signed into law by the president in November 2013. As healthcare providers we need to look at how we gather, process and store medical, personal and financial information about our patients. Practitioners who do not comply may suffer reputational damage and lose patients (or fail to attract new ones.) Legal sanction may be civil (in terms of damages) or criminal, with fines up to R10 million or 10 years in jail, so it's worth knowing a little more about the Act.

The next issue in this series will deal with the Act in more detail.



All the TED talks in this series are interesting, but you need watch only number 5 (*Why privacy matters*) for the purposes of this article.



## Pop genetics

Genetic sequencing by [23andMe](#) can predict whether you will get ear wax build up ([rs17822931](#)) or whether you're likely to sneeze when you look at a bright light ([rs10427255](#)). More significantly, certain genetic regions signal an increased risk of breast [cancer](#), the impending onset of metabolic diseases, and sensitivity to medications. However, any product intended to 'cure, mitigate, treat, prevent, or diagnose a disease' is classified in the US as a medical device and is regulated by the FDA to ensure its safety, and also its efficacy. After shows of force from both parties, 23andMe discontinued sales of its health testing kit late last year. You can still track your genetic heritage for \$99. [Scientific American](#) writer [Charles Seife](#) says that the FDA's preoccupation with the accuracy of the tests means it's not fulfilling its mandate as regulator. 'The Personal Genome Service isn't primarily intended to be a medical device. It is a mechanism meant to be a front end for a massive information-gathering operation against an unwitting public.'



Sounding slightly paranoid, he explains by referring to Google: We all know that Google is a search engine, right? It helps us find the information we're looking for, right? But to do so, it must gather information about us. Our every Google search is [stored indefinitely](#) and cookies are left on our computers to further track our online behaviour. This volume of data allows Google to deliver individualised advertising to us, for which service it earns \$40 billion per year. Don't get me wrong, I love Google and use it all the time. I just don't have any delusions about what they're doing. (Coincidence that one of the founders of 23andMe, Anne Wojcicki, is married to Sergei Brin, a founder member of Google?) Eventually, some company will become the Google of personalized health care. Will we find it as helpful as we find Google? Considering how many people have a morbid fascination with 'medical' programmes on TV, I have no doubt that 23andMe's half a million members will grow. Who would not want to receive medical information specific to their genetic make-up? And when your click signifies your interest in, let's say [male pattern baldness](#), they process that information and present it to others who share some of your genetic markers for hair in this case. 23andMe are looking to recruit volunteers with specific conditions, specifically Parkinsonism. (Brin's mother has Parkinson's.) They claim to have identified 2 Parkinsonism genes and [20 genetic associations for myopia](#). All good, until they notify (in terms of the small

print of that in-house medical aid agreement that you signed many years ago) your employer that you are at risk for developing Parkinson's. Would an employer continue to invest in an employee who is at risk for a career-ending disease? Would you? The implications of 3<sup>rd</sup> parties having access to our information exceed our wildest imagination. After all, Mrs Rattanakosin's daughter could not have anticipated that her quirky birthday gift to her mother would alert an optometrist in South Africa that she had an increased risk for glaucoma.

The fictitious (for now) HealthNet system would work like this:

Practitioners and patients register (at a cost) with HealthNet and provide/ gather the information that HealthNet processes and makes available to its partners (at a cost.) Imagine what pharmaceutical companies would pay to market their glaucoma drops to Mrs R! On the other hand, HealthNet can (incorrectly) show non-compliance with medication so perhaps she'd better have a peripheral iridotomy. Would it be helpful for HealthNet to recommend to her the specific brand of laser that would be most suitable for non-compliant, narrow angle patients exactly like her? No doubt they could recommend an ophthalmologist near her, based on his/ her willingness to charge their tariffs and use their partners' products and services rather than his/ her clinical knowledge and surgical skill. But how would Mrs R know what the inclusion

criteria are? If you are a HealthNet partner, she can only assume that you endorse them.

And let's not forget that Mrs R is not even really at risk. The system has flagged her incorrectly.

And now her insurance broker (also a HealthNet partner) is also keen to

sell her dread disease cover. With access to her insurance portfolio information, he has been able to customise a policy specifically for her.

'While [the FDA concentrates](#) on the question of whether 23andMe's kit is a safe and effective medical device, it is failing to address the real issue: what 23andMe should be allowed to do with the data it collects. For 23andMe's Personal Genome Service is much more than a medical device; it is a one-way portal into a world where corporations have access to the innermost contents of your cells and where insurers and pharmaceutical firms and marketers might know more about your body than you know yourself.'

[Google's privacy policy](#) has stealthily gone from requiring your consent to share information, to where they now undertake not to disclose your sexual preferences or whether you have heart disease. The rest of your medical health, your race, religion and politics are fair game. Should information holders like Google be regulated? What government or organisation would regulate them? How can any regulation be effective if we can already [obtain raw genetic results](#) online (from outside the US) and there are open source tools to analyse that data? How can patient information be protected? Here at home, could the Health Professions Council do it? It is their mandate to protect the public, after all.

[Ronald Bailey](#) is not positive about government regulation of healthcare information. He says: 'The FDA bureaucrats think that they know better than you how to handle your genetic information. This is outrageous.' [Timothy B. Lee](#), in the [Washington Post](#) says that any risky medical decisions that patients may make based on 23andMe's services would involve a medical professional, and (he implies) those professionals are regulated already. Regulation of 23andMe is therefore superfluous.

While the Health Professions Council's mandate is to protect the public, it's jurisdiction is limited to registered healthcare practitioners. Council's jurisdiction does not ordinarily extend to a multinational corporation such as 23andMe. The bottom line remains that no matter how convincing the information that your patients access, or bring to your attention, no matter how hi-tech the test, the final clinical and legal responsibility lies with you.



Time for some thinking!

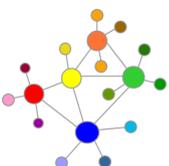
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## Questions

Please login with your e-mail address and registration number at [www.synapse.org.za](http://www.synapse.org.za) to answer these questions online.

1. American legislators are concerned that the cost of electronic health record (EHR) systems will increase healthcare costs in the long term.
2. The South African Optometric Association endorses HealthWeb.
3. Healthcare practitioners will not be held liable for decisions made based on electronic health records held outside their country of registration.
4. It is not in the patient's interest to use an EHR system.

5. Practitioners who participate in EHR systems, whether by accessing or by uploading) are required to have additional indemnity insurance.
6. Glibenclamide (Daonil) is an oral hypoglycemic which may cause photophobia, dizziness, headache & visual disturbances at the onset of treatment.
7. Daonil counteracts the therapeutic effects of ACE-inhibitors.
8. Sulfa drugs cause Stevens Johnson Syndrome.
9. There is a genetic component to the risk of undeveloping Stevens Johnson Syndrome.
10. Oral antihistamines and decongestants containing diphenhydramine, pseudoephedrine and phenylephrine cause slight pupil dilation and can close a narrow angle.
11. The World Health Organisation (WHO) requirement that medications should have the same trade names applies only to Commonwealth countries.
12. Bitcoin currency is regulated by the World Reserve Bank in Switzerland.
13. In the US, any product intended to cure/ treat/ prevent a disease must be tested by the FDA to ensure that it works and that it is safe to take.
14. The FDA completely fulfils its obligation to protect users of 23andMe by ensuring that the test works correctly.
15. Patients have a right to access raw test results without having to consult a practitioner because there is enough information available online nowadays to help them make autonomous decisions. (There is no correct answer here, but I hope you will think about cases where this may be acceptable, and where not.



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For the test,  
pick **true.**)

## Funny graphs, unfortunately very true

