

Prescriptions

Issue 7.1

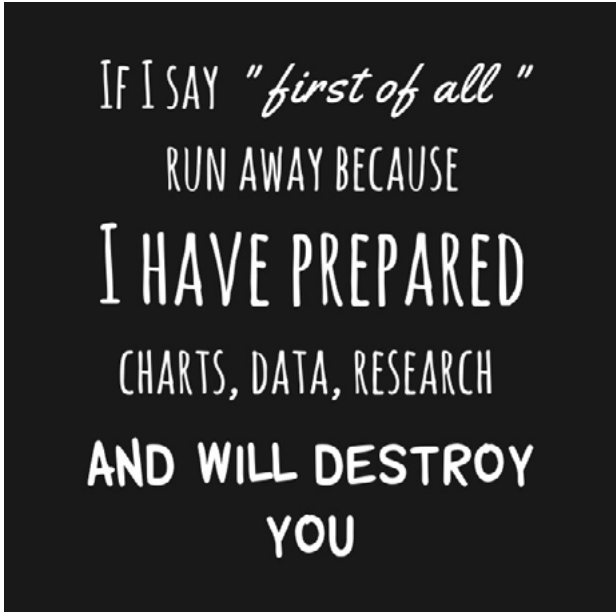
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1 CEU (Ethics)

ODO....

Many years ago we diagnosed a patient with glaucoma, confirmed by the ophthalmologist who prescribed Alphagan bd and Xalatan hs. His medical aid sends chronic medication directly to their patients. His address being 'the 3rd dwelling from the large rock,' and our post office being what it is, he was constantly running out of meds. I offered to receive his meds on his behalf. Things improved somewhat, but he would come back for Xalatan before we had received the next month's meds. It was only then, I'm embarrassed to admit, that I realised that the Xalatan was 2.5ml and the Alphagan was 10ml. I called the medical aid, and eventually got to speak to the pharmacist, who assured me it wasn't his problem. The ophthalmologist had ordered it like that. Challenge accepted.



IF I SAY "first of all"
RUN AWAY BECAUSE
I HAVE PREPARED
CHARTS, DATA, RESEARCH
AND WILL DESTROY
YOU

How many drops in each bottle?
According to [Wikipedia](#) the 'volume of a drop is not well defined: it depends on the device and technique used to produce the drop, on the strength of the gravitational field, and on the viscosity, density and the surface tension of the liquid.'

For prescription purposes we assume a drop to be approximately 0.05 ml or 50 microliter or 20 drops/ ml. Smaller drops can be produced e.g. in an IV drip. So our patient was getting about 50 drops of Xalatan for his 60 doses (30 days x 2 eyes.) The Alphagan was no problem at 200 drops for the 120 (bid) doses.

Drop size comes up from time to time, exactly in this context. The [human eye can only absorb 7 microliters of fluid](#) so the rest is wasted. In the US, some glaucoma meds cost around R4000 per month so it's a relevant discussion, and (it being the USA) a few patients are suing the drug companies. If their bottles produced smaller drops, they would save money. It's not absurd: We have a patient who, concerned about the cost of her glaucoma meds, has tried 'weaning' herself off them and has alternated her combination drop

with a second, less effective drop that she got at the hospital... none of which is helping her IOP.

A microdrop system was developed, tested and reported in the [Feb 1992 American Journal of Ophthalmology](#).

The motivation at the time was mostly to reduce side effects - burning and redness - and indeed, a drop size of 16 microliter was found to be effective, with fewer side effects.

ide.⁹

Previous studies with topical alpha-agonists¹⁰ and beta-blockers¹¹ suggest that reducing the drop size affects intraocular pressure reduction minimally. The eyelid fornix normally holds less than 20 µl of solution.¹² A smaller eyedrop decreases the amount of medication reaching the eye and may allow for decreased eyelid pumping of the eyedrop and decreased systemic absorption. A smaller eyedrop may deliver a bigger effective dose because washout of medication through tearing would be minimal.

We evaluated the intraocular pressure reduc-

By holding the bottle at 45 degrees, or even horizontal, patients can reduce the drop size, according to [this 2006 study in the Journal of Ocular Pharmacology and Therapeutics](#). Dosing with 5, 10, 15, 20 and 30 microliters have all been [tested and found effective](#). So, should we start prescribing instillation techniques to our elderly, anxious glaucoma patients? On the other end of the spectrum there's the type that forgets their drops for days and then uses the stuff hourly when they happen on the bottle

again. There must be a better way to dispense a smaller drop... surely!

Besides the angle of the bottle, there is significant variability in the number of drops that can be dispensed from a bottle. Using an automated system with a standard pressure, [various brands of glaucoma meds were tested](#) in both the horizontal and vertical orientation. The main outcomes measured in the study were:

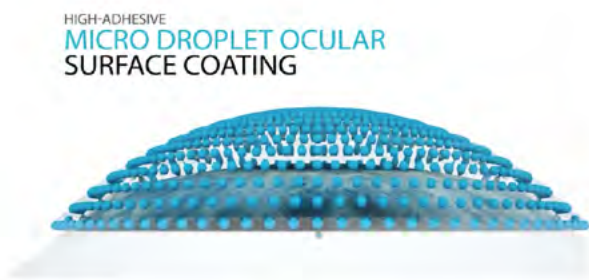
- total number of drops,
- volume per bottle
- drops per milliliter (ml)

'A total of 192 bottles from 32 bottle designs and manufacturers were tested.' Twenty-two of the 32 bottle designs had a significantly different number of drops, 10 gave more drops when held horizontally, 12 gave more drops when held vertically. 'An adjusted ratio of mean number of drops/mean bottle volume demonstrated a range from 20.9 drops/mL to 40.8 drops/mL.'

Eyenovia is working on various microdrop delivery systems, but rather than reduce the price of the final product, the technology may increase it. Also, any new drop dispensing system may have to be approved by regulators such as the FDA, adding to development costs.

So compliance may improve, and side effects decline, but patients are bringing their law suits based on presumed savings if smaller drops are dispensed, and that saving is unlikely to happen.

Watch the Eyenovia [video here](#).



Watch a brief video about our technology

So let's get back to my patient.

Two things:

1. He is a conscientious, but unsophisticated man who did not have the means to challenge this poor service from his medical aid-employed pharmacist and would have remained undertreated without our assistance. One hopes the pharmacist had clinical independence, and was simply negligent here, and that the employer had nothing to do with this.
2. A pharmacist (or any healthcare practitioner for that matter) who limits him/herself to mindlessly filling prescriptions, rather than working to their full scope and knowledge, is behaving unethically.

Compliance will always be a problem in dealing with glaucoma. Keeping patients motivated to continue their meds when deterioration is not obvious is a mission! In this case our patient was switched to the generic version at some point. He did not understand why his medical aid kept switching his meds and he lost faith in the system. His compliance flagged and we eventually lost him to follow up after about 2 years of fairly consistent monthly care.

Just how prepared are patients to have their medications updated? *'Polypharmacy in older adults is increasing in prevalence, expensive, and potentially dangerous.'*

In a [survey of 2000 US Medicare beneficiaries](#), mostly white and female, and aged between 65 and 74:

- 90% believed that all their meds were necessary
- 92% were willing to reduce their meds on their doctor's advice, but
- About half were reluctant to stop taking any meds they had been on for a long time
- 66% wanted to reduce their meds, particularly those on 6 or more meds, who were 3 times more likely to want to reduce their meds

- 40% of respondents took six or more medications, yet
- nearly half rated their own health as excellent or very good, so this was not a sickly population!

Many years ago I saw a new GP for a routine exam, and he kept asking if I really had no complaints. The poor chap seemed to think I was hiding something from him. Now that I'm older and have questions each time, I miss the days when I could leave the doctor's office without a prescription for medication or lifestyle change.

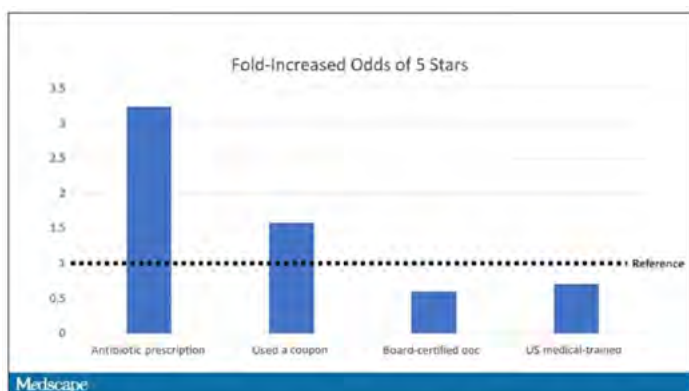
We've all experienced pressure from patients to prescribe something, to do something. Healthcare regulation helps to limit such pressure in South Africa, where direct-to-consumer advertising of prescription medications is not allowed. In the US, practitioners have to deal with patients informed (or influenced) by marketing campaigns, encouraging them to ask their practitioners to switch them to alternate meds. A request for switching meds is no problem, but should be based on therapeutic effect and side effects rather than an advert of a nice middle aged couple playing, in slow motion, with their dog on the beach.

Let me hasten to add that I don't think regulation is the answer. Too often, regulators tighten control in a knee jerk reaction to a problem before applying their minds properly.

Five years ago, with the growing opioid addiction in the US blamed on excessive prescribing, [scheduling of hydrocodones](#) was tightened. I wouldn't be telling you this if the outcome had been to curb opioid use, would I? In fact, prescriptions increased. Did the patients ask for more? Not necessarily. The outcome of the tighter regulation was that a patient could no longer phone for an extension of their prescription. They would need a physical prescription, a prospect that does not ordinarily excite a surgeon, or the patient for that matter! To prevent being called out to write a script, the doctor simply writes more to start off with... leaving those extra 3 or 4 tablets lying around to fuel an addiction.



There's no denying that happy patients are practice builders, and now digital platforms allow (even encourage) patients to rate providers. A [recent study of 8437 patients](#) seeking care for a respiratory tract infection in a US direct-to-consumer telemedicine setting, 66% got an antibiotic. The rate of prescriptions ranged from 19% to 90%, and patient satisfaction was strongly correlated with prescription patterns. Those who got antibiotics were happier than those who did not. In fact, [prescribing antibiotics was the surest way to get 5 stars](#). The top 10% in the satisfaction scores all prescribed antibiotics at least 75% of the time. The non-prescriber practitioners were all in the bottom half for satisfaction.



One commentator pointed out that a [tele-practitioner is unable to assess the patient](#) to make the differential diagnosis between a common cold and sinusitis, in which case an antibiotic would have been appropriate.

The argument is that the diagnosis is being adjusted to justify the antibiotic prescription. Practitioners in high volume settings like tele-medicine and emergency rooms are most likely to overprescribe.

This confirms an [earlier study](#) comparing clinical outcomes and patient satisfaction after

- immediate antibiotic prescription
- deferred antibiotic prescription
- no antibiotic, but with a patient education intervention.

Patients with the immediate antibiotic prescription were significantly more satisfied with their care, despite all 3 groups' clinical outcomes being the same.

It seems that taking the time to sit down with the patient and explain makes little difference. And not everyone has time in their particular setting to explain. Not surprising then, that it's in emergency care settings that antibiotics are overprescribed most, as [this study](#) explains. Perhaps prescribing something is a replacement for taking time to listen or explain.

You may remember from [a study](#) that I've referred to before, that practitioners who spend more time with their patients were less likely to have malpractice claims.

These no-claim practitioners spent on average 18.3 mins with patients, compared to 15 mins for those who did have malpractice claims.

Tone of voice and explaining the examination process were also independently related to the likelihood of malpractice claims.

Interventions focused on educating practitioners of the risks of over-prescribing, and how to educate 'pushy' patients may miss the point, says [Dr Jeffrey Linder, who studies outpatient antibiotic prescribing](#).

Practitioners are prescribing antibiotics even when they're not seeing the patient, or when they're not recording an infection-based diagnosis. Researchers looked at 2 years of electronic health records - 279169 patients - and divided encounters into 3 mutually exclusive groups:

- infection-related diagnoses associated with at least one of 21730 ICD-10 codes that may signify infection
- non-infection-related diagnoses, i.e. associated with the 72,519 ICD-10 codes that do not signify infections
- prescriptions associated with no diagnosis.



Only 54% of antibiotic prescriptions were infection-related; leaving 29% which were non-infection-related, and 17% with no diagnosis.

Whether we rely on word-of-mouth to grow our practices, to improve our online profiles, or to get onto a provider panel, we are all under enormous pressure to keep patients happy. The difficulty is balancing that with what's best for the patient.

[Some frustrated comments referring to the article:](#)

- *'I do think this needs to be treated like the public health issue it is, complete with a media campaign. Something like, "This is your colon before you took that unnecessary antibiotic for your cold", with a photo of nice, pink, healthy mucosa. And, "This is your colon after you took that unnecessary antibiotic", with a photo of weird-looking, bright yellow pseudomembranes. We'd need a campaign directed at prescribers, too.'*
- *... 'Somehow I doubt that would plump up 'patient satisfaction scores.'*
- *'This seems to be a strong argument for ethical prescription of placebo... in a non-deceptive way....'*

- *'In any case, we can guess that very few of the satisfied customers receiving antibiotic prescriptions have anything actually approaching informed consent: "I am going to write you a prescription for a medication which will not benefit you, but will expose you, and everyone else, to a significant risk of harm."'*
- *'I found that the usual arguments failed to convince patients: CDC recommendations, drug resistance, risk of diarrhea and C. diff, lack of efficacy against viral infections, etc. Only ONE argument seemed to have any effect at all: the prolonged disruption in the microbiome after a single course of antibiotics... and the link between microbiome disruption and obesity.'*

(Those of you who attended Synapse Congress 2017 at Zorgvliet Estate, Stellenbosch, will remember clinical pathologist Dr Johan van Wyk telling us all about this, as well as the effect on autoimmune disease and linking it to dry eye.)

Besides oral antibiotics for colds, practitioners today tend to [over-prescribe statins](#), overscreen for [retinopathy of prematurity](#), which is apparently less common than we thought, [follow up excessively](#) after

cataract surgery, and [needlessly instill antibiotic drops](#) before intravitreal injections.



Healthcare providers are sometimes criticised for not listening to patients, but we must also listen to our patients selectively. Tall order! I have had well-informed friends consult me after being prescribed spectacles elsewhere, and finding a negligible Rx. It's not easy to convince them that they don't need to wear glasses.

When this conversation is about their children, it's even more difficult. There's no direct harm, like with the antibiotics, but there is the expense and managing the stigma, if the child doesn't want to wear them. Of course, many children now do want to wear glasses. How do you approach it?

How will we approach it when we can prescribe medications? When we must decide whether to follow or to treat a suspected glaucoma? Will we err on the side of caution, or on the side of income? Clinical and financial decisions always overlap, and the ethical practitioner should be mindful of this.

Questions

1. Medical aids may own and operate pharmacies to supply members with medications directly.

- a) True, if meds are prescribed by a licensed practitioner
- b) False
- c) True, provided the medication is for a chronic condition.

2. The size of a drop depends on

- a) the viscosity, density and surface tension of the liquid.
- b) the dispenser/ dropper
- c) both a) and b) play a role

3. The eye's fornix holds about ...

- a) 7 - 20 microliter
- b) 50 microliter
- c) 1 - 2 drops

4. Microdroplet medication dispensing...

- a) is used for homeopathic meds.
- b) is effective for several glaucoma medications.
- c) works out cheaper.

5. The abbreviation for 'drops' comes from guttae, the Latin word for drop and is:

- a) gt (gtt being the plural)
- b) gtt (with gtts used for the plural)
- c) both a) and b) are used.

6. Which statement is **false** about the willingness of older patients to drop chronic medications?

- a) Reluctant to discontinue those they've been on for a long time.

b) The more medications they are on, the more amenable they are to having that number reduced.

c) Older patients should have antibiotics tapered, rather than abruptly switched.

7. Tighter regulatory control of medications does not...

- a) Reduce prescription writing for that drug category
- b) Increase the administrative burden on suppliers, prescribers and dispensers.
- c) Affect black market prices.

8 Doctors over-prescribe antibiotics because...

- a) They overestimate the prevalence of infectious conditions
- b) Patients expect to be given some sort of treatment, even antibiotics, for the common cold
- c) Conservative protocols recommend antibiotic cover to prevent secondary infections.

9. Overprescribing antibiotics can cause...

- a) Drug resistance
- b) Cardiac complications
- c) Obesity

10. Overprescription of antibiotics is higher in...

- a) The pediatric patient population
- b) Urgent care settings
- c) Nurse practitioner environments

