Hello and welcome to the Rx Counter podcast produced by student pharmacists at the University of Iowa College of Pharmacy where we help you stay informed about hot topics facing the profession. I'm your host Matt Yates and with me today is fellow student Andy Jade discussing article pharmacogenomics prescribing precisely by dice and awake at all. Andy the counters yours?

Unknown Speaker 0:26
Thanks, Matt. And today, again, we're going to just be discussing some basics and pharmacogenomics and just some things that I think might be important for the current pharmacy student or recent graduates. So actually, the the paper provides some just key points that think is a good overview of what pharmacogenomics kind of gets into. So what is it? It's the use of patient specific genetic variations to guide medication selection? So what does this imply necessarily like what kind of genetic variations are we looking at? potential changes in the number one You're metabolic enzymes. So for us, we're pretty familiar with the SIP enzyme systems, and our liver and a few other locations in our body. Key drug transport, drug drug transporters are receptors. And again, why are we kind of looking at this, there's two kind of main categories that we're going to use pharmacogenomics. One is to ensure that our drugs are efficacious and are working properly and to also potentially decrease the risk of side effects. So, and an overall points. There are some new guidelines coming out. So I think it would be important for us to review to some of the resources that are important for pharmacist. But kind of getting back to why is this important for pharmacist as pharmacists? You know, we're kind of the drug experts, we're self proclaimed job experts. So we're supposed to be knowledgeable about pharmacogenetics and pharmacogenomics and Drugs. That's kind of my role in the medical team. So, I'd say most people agree that we're supposed to recognize key drug drug interactions, common drug interactions, especially if run rounds or checking verifying prescriptions and a pharmacy. So, if pharmacogenomics provides information to us about key changes and final code kinetics or pharmacogenomics, I'm going to pose the question to you guys should we then as pharmacists be able to recognize those and make appropriate therapeutic suggestions to a team

Unknown Speaker 2:36
right um, so this podcast and and podcast in the past have always brought up costs. And part of the definition of a pharmacist In my opinion, and probably as a whole is just reducing overall health care expenditure. And I think if we look at the patient overall, and we look at their medication regimen, and we see those drug drug interactions are those interests. actions that tell us that we should not have this patient beyond this medication because a might not be producing a therapeutic benefit. Be could be producing a drug drug interaction, or see potentially putting the patient at harm. And these things are all the downstream, increasing cost. And so in my opinion, making that intervention with the patient, with the physician with the breast, the medical team is very important in reducing those costs, and overall, increasing the patient's health outcomes. And I think that is very important for us as pharmacists to consider.

Unknown Speaker 3:33
Yeah. Now, Aaron, that's a great point. I know, some opposition for genomic testing is the potential for insurance companies to cover these. These tests, essentially, which has been more of a concern in the past and actually night healthcare couple months ago, just approved genomic testing. They're going to pay for genomic testing specifically for some mental health disorders because There's actually kinda like you're saying with the saving cost, when you think about starting a patient on an antidepressant, and, you know, we talked about it's, there's never really one right drug in that case, there's a wide variety, you know, you try a couple, you see what works for the patient. So the idea with pharmacogenetics, there is essentially like what you were talking about is knowing based on and they're this, you know, sin ultra rapid or the seven. Not, you know, just the basically the phenotypes which we could get into a little bit. Again, it's, it can potentially save a patient from trialing a drug that we know based off see pic guidelines and some other resources that are going to be really therapeutically beneficial for them.

Unknown Speaker 4:45
Right there. There's not lab values for us to monitor for depression or anxiety. And so figuring out the best treatment and that might require some trial and error, but reducing the drugs and the treatments that are we know for a fact are not going to produce a therapeutic benefit, right off the bat will narrow our choices. So I think, you know, from insurance standpoint, from a player standpoint, it's very important. Yeah, I think I mean, they're the ones who are processing these claims and ended up paying for them. So I think if they're trying to reduce their costs, which obviously they are, I mean,
the covering a pharmacogenetics test, which I believe are roughly around $300, I could be wrong. I mean, downstream costs, as I just said, is huge. And I know that insurance companies and parish probably don't like looking at that the increase in cost up front, because I mean, this does increase short term costs by covering a pharmacogenetics test that does increase your current short term costs, because you have that $300 transaction right up front. However, you changing the course of therapy, the based off of the results of that test, would potentially save thousands of thousands of dollars per patient. I mean, because when we look at it The cost typically are not associated with just the prescription drug. However, it's hospitalizations and things that result from that. So I think that if we can just reduce those hospitalizations at the beginning based off of those pharmacogenetics tests, that will save huge cost. Oh,

Unknown Speaker 6:18
yeah, that's definitely like a big point that the paper gets that is kind of the responsibility we have to have as pharmacists potentially being the stewards of pharmacogenomics cuz it's a new area we can really can't take this on and our institutions is understanding how to apply it in like a clinical context. It's not necessarily gonna tell you exactly which medication use but part of the discussion of its it could be a critical part of the discussion, like you're saying for cost saving effectiveness, kind of what we know about it. So applying it in the scope of over you know, analyzing the whole patient. It's definitely could be a potential big resource for us. I know That something that some people would point out as well, the data is not really necessarily there yet, which is true for a lot of genetic variants that we have. But again, getting back to the resources, we have the see pic guidelines, the farm GKB. I know if I heard some professors mention these before, I think those are resources that, you know, again, in class, we don't really have much time to get over it. But as students wanting to just kind of take the initiative to look into them a little bit more and just become a little more familiar. I think it'd be a good test potential when you go on rotations just to shut that institution. Ask them what is your policy for a direct to consumer test. So something like a patient has 23andme data and then come to the hospital? What does the hospital do with that? That's interesting, because technically, the FDA currently has a policy, just a statement. Let me read it for you guys.

Unknown Speaker 8:02
One second.

Unknown Speaker 8:06
That is current policy on it's just a disclaimer on direct to consumer testing like 23andme. Or that one other one, we're talking about the RXX right RX. This test should should be used appropriately because it does not determine whether medication is appropriate for a patient does not provide medical advice and does not diagnose any health conditions. consumers should not use this test to make treatment decisions on their own. Any medical decisions should be made only after discussing the results with the licensed healthcare provider. And results have been confirmed using clinical pharmacogenetics testing. So that kind of gets into the the complexity with some of these tests with they all kind of have their own specific algorithm on how they create a clinical decision. And like we were looking at that one test. They usually use like a stoplight. Like a green, yellow red system. And sometimes like that one, for example show like the actual star illegals are not I'm not sure if it did, I might have been a little bit more detail. But kind of like the issue with that is some pharmacogenomics people would point out is that it might oversimplify to a patient, you know, I've been on this drug that's in the yellow, I should like be concerned or something like that. So it just gets into the need, for more research, the need for consulting that, you

Unknown Speaker 9:32
know, I think that also shows that it's very important that these results need to be interpreted by educated healthcare. Yes, exactly. Not be just handing out these complex results to the patients without that background and say, all right, this one's red. Don't take it. This one's yellow, you can consider it This one's green, you're good to go. That doesn't mean much then because first of all, they don't even know what those bad thoughts so I mean, the it's very important for it to be interpreted to them and that may be something that An insurance company or a payer can look forward into the future and say, you know what will cover the cost for the patient, but will also cover maybe a 30 minute or 60 minute consultation with the healthcare provider to interpret those results. So the patients don't just take this home and say, I'm going to stop taking my amitriptyline and then all of a sudden they have some kind of complication down the line.

Unknown Speaker 10:20
Not a very good point. And there's a big part during the ACC meeting that a pharmacogenomics session on this ad, and
they talked about just educating a patient on really like a direct to consumer test or any kind of pharmacogenomics testing. What does this mean? and educating a patient is probably the most important thing over and over again, with pharmacogenomics because it's kind of a very quick growing field that's going to have a lot of change. Something they pointed out was that there was recently so basically, you hit the genes sit like to the six star, whatever. That's the half Type or deploy type. So there's if there's two stars, that's the deploy type stuff at star one, Star two, whatever that tells you that one of this one of this from there, basically those would be your those would be the theoretical genes from your parents. So, pharmacogenomics testing can either be done on the germ cell lines that you inherit from your parents, or that could be on your somatic cell lines that just evolved throughout your lifetime. So most of what our current genomics is testing is the germ cell lines that we pass on, which is what I'm trying to get at with that is just the importance of basically just recognizing the relationship between a genotype and the phenotype. And they're actually recently they had to redo a lot of the CIP guidelines because they, they found out that there was one of the one of the star labels was correlated to a phenotype that didn't exactly they adopt data from like an ultra intermediate Delta rapid metabolism. Say for example, So like it's a growing field. So patients, you know, I explained to them that, again, like essentially what you said someone needs to sit down with these patients. That's the important thing next by that time. So my question is for you, do you think that pharmacies should also be pairing potentially with some of these direct to consumer tests that potentially offer a session where they could come in talk to a pharmacist who's been trained, you know, proper training and interpreting some of these results, and just explained to them what this means? Do you think that'd be a potential new service that pharmacists can offer?

Unknown Speaker 12:34
It'd be hard for a real viruses to do it because, like, going through school, we don't have any training with genetics and interpretation of that. So how do you expect that all the practicing pharmacists now are going to learn how to do that when most of them don't even want to adapt to those smaller changes? of providing MTM services, stuff like that. And so breaking into the larger corporations like the CVS, the Walgreens and really allowing them to see all the genetic components, I don't know if we want to give them the raw data. Yeah, from the tests like 23andme or whatever you're going to use but if we could have a centralized area of interpreters with more geneticists or whoever does that, I don't know.

Unknown Speaker 13:37
That gets tricky then because essentially what you know, as pharmacist potentially pushing for new roles right rod cabinet field, right be like an adaptation is essential to our survival, just because of the changing environment. So like, right now is probably like a great time to either just self educate ourselves as to Students or I know, as HPA CCP that have online classes you can take to get a certificate and pharmacogenomics. I'm sure they're a little pricey, but there's options out there. And they offer those to practicing current practicing pharmacist and all that the University of Florida, I think, actually has a master's degree that they offer for pharmacogenomics, which is interesting. So what I'm trying to get at with that is that there will potentially be a new roll off to the offers on this paper actually work at North Shore Hospital in Chicago, and they have their own department for pharmacogenomics. I'm sure they're a little ahead of the times, I'd be interested to ask. And this kind gets into like when you're on rotations as University of Iowa, what's what's, you know, what's their infrastructure for building in pharmacogenomics testing into their you know, epic Pro, you know, profile where does any permission Erica's say you get a random patient. Start on the A fire burning by pronounce that right? Like Dr. Areas tank on her perch child started for his whole sort of colitis, or they started for some kind of cancer or something. Now that TPMT gene, where does it show document that result in a medical record? Because if it just gets put into that date that you know, that one encounter, and it's going to be buried

Unknown Speaker 15:24
hundreds of records down, you may never see it again. No,

Unknown Speaker 15:26
exactly. So that poses a big challenge. And it's more about on the side of informatics, about incorporating these results into the medical record. I think it's exciting, like I was curious to see what they do at the University of Iowa here just because I've never seen a genomics tab and or like a genetic, you know, so as it becomes more popular as it becomes more common, and we're moving from testing just a single nucleotide RI testing for TPMTM or for sequencing the whole genome or something like that. Where are they starting that in the medical record, so only Most pop up or flag or lead providers or pharmacist know that now this patient has this and that also gets into Howard potentially community
pharmacists, can I integrate that into their, their verification systems as well?

Unknown Speaker 16:14
to pedal back a little bit? Sorry, go ahead. Yeah, about the putting in outpatient setting or should we train pharmacists about this? I think it's very strategical, I don't think that we can just say, all right, this is not a requirement for every single pharmacy setting and now to be experts in pharmacogenomics, therefore, you know, what we need to be doing is being strategical about who's doing it, or do we have some progressive pharmacists out there who are already providing these complex services? If so, they're probably good candidates for doing pharmacogenomics stuff. And if not, they're not doing that. Let's start them off with something less complex and let's just kind of try to get them moving for get the ball rolling so we can eventually get them involved. And then as we get those people trained, as we mentioned it where's it going in the middle Record. This needs to be information that is universally available to all healthcare providers. Because if somebody gets it done at some setting, and then they use it in that setting, but then they're the only setting that knows about it, and then they move, all that work was just went down the drain because only one person knew about it. And I'm sure the insurance companies and payers are going to say, All right, we'll pay for another another set or another test, and then we'll pay for another consultation, no needs to be strategic options. Should TC critical downstream or downstream or upstream I'm sorry. So we can make sure that

Unknown Speaker 17:34
we all connect

Unknown Speaker 17:36
its business thought based system, right or agent medical, right? It's

Unknown Speaker 17:41
more than just you know, this person had this pharmacogenomics results. It's this person tried this medication and it did not work for them. Let's write a complex soap no documented and talk about what the reaction was and why they shouldn't be taking it there for definitely, or maybe this person was successful on it, even though they pharmacogenomics results, said Maybe they weren't supposed to be on it. So I think that there's these genomic results are great for baseline, like understanding and maybe guiding you in the therapeutic choices. But we need to continue to document what exactly happens with each patient when they're on these medications that moment results say that they should or should not be on. And then that needs to be available to every single health care provider who's going to make future recommendations.

Unknown Speaker 18:27
Yeah, that's, it's interesting that you bring that up, kind of how do we implement this stuff. And as another resource to throw out there. There's implementing genomics and practice initiative, it's ignite for short, he has not look it up later. You can, but basically, they're NIH funded, I believe, to investigate kind of more like a clinic almost like clinical trials in a sense of implementing these and documenting kind of newer drug gene pairs to investigate and how we gonna document these results because basically to get to us a guideline, that's a, those are published all on PubMed. They're available for everyone to see. They're backed by a SHP and a couple other organizations. So to get to that level for gene pair, for example, like it requires a lot of evidence and again, continue documentation because I believe in our lecture the other day about the out Paranal at HLA eg and one of the those, it said something or maybe I looked it up later, and it said something about the prevalence of it was only went from like point 0001 3%, the normal Caucasian population to like 1% in the Asian population, which 1% does not sound too bad, but something that severe is detrimental. So right,

Unknown Speaker 19:43
and I think there is a we read about these with our brain. They talked about you know, this only happened in XML is a small number percentage of the population. However, when it does occur, it is definitely there can be definitely Yeah, so I think those are interpretations that we need to tough work into

Unknown Speaker 20:01
any other thoughts on that before we close up?

Unknown Speaker 20:04
I, you know, I think that based on a lot of pharmacogenomics today, that's a growing field that everyone should at least take some time into looking into. Maybe it's not for them after they look into that. But I think that's something to be open minded about, because it is f1 that we are trying to, you know, grow as a profession move forward as a profession and provide the services. So that's definitely opportunity, a very unique opportunity for pharmacists to be enrolled.

Unknown Speaker  20:29
I agree. This can one last point then. So what can we do now as the students just to wrap it up? Ask You know, when you go on rotations ask about policies about how are they implementing these genomic tests for their medical record or whether they do a direct to consumer testing and they kind of throw out that information or they retest? Do they talk a patient through educate them on what the results mean? And just become more familiar with see pic guidelines and resources like the farm QKB just to potentially then You know, everyone has to be an expert in pharmacogenomics to apply it, but just potentially being stewards as the profession for pushing pharmacogenomics forward. I think that's important.

Unknown Speaker  21:09
So, yeah, Andy, thanks for bringing this to our attention. Sounds like you get a lot of new jobs out there as we face it. Scary market place. So hopefully, you'll learn something. Have a good day.

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