Original Work

Commercial Member Perception of a Pharmacogenomic Testing Program Led by a Pharmacy Benefits Manager

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Abstract

Objective: Pharmacogenomics (PGx) is the study of the role of DNA in an individual's response to a drug. The results can be used proactively to select a personalized medication. Some pharmacy benefit managers (PBMs) offer PGx testing to members, but the member experience is unknown. This study explored the perceptions of two commercial client populations invited to participate in a PGx testing program.

Methods: Members who underwent testing completed an anonymous written survey assessing the test's ease of use, their understanding of PGx, the usefulness of the results, their plans to share the results, and whether they would recommend testing to others. Members who declined testing were surveyed on why they did not participate. Descriptive analyses were calculated for each question.

Results: Most members who completed the test agreed or strongly agreed with each survey question: test directions were easy to follow (96.6%); they understand PGx after meeting with a genetic counselor (70.7%); they plan to discuss the results with their doctor (82.4%); the test can help doctors choose personalized medications (70.7%); and they recommend the test to others (69%). For members who declined PGx testing, common reasons were concerns about personal health information being used (36%) and other unlisted reasons (30%).

Conclusions: Results suggest that most members who complete the test can identify the intended benefits. For members who declined, the survey demonstrated that the test invitation does not adequately address their concerns. Results will be used to improve member education and experience, and highlight best practices for PGx testing programs.

Pharmacogenomics (PGx) is a tool used to predict a member's response to a medication in terms of efficacy and side effects.[1] Pharmacogenomics uses a member's DNA to determine an individualized medication and dose that is likely to be effective with a minimized chance of side effects, based on how their body will process the medication. For example, a pharmacogenomic test can determine that a member has a lower count of an enzyme called CYP2C19, compared to the accepted "normal" amount. CYP2C19 is known to break down and metabolize medications such as sertraline, a drug that treats bipolar disorder, generalized anxiety disorder, panic disorder, and other mental health conditions.[2] In a member with decreased CYP2C19 activity, it will take longer to break down the sertraline, which will cause an increase in exposure to the drug and higher risk for unintended adverse effects. In this scenario, a prescriber could use the member's pharmacogenomic results to guide the prescribing of sertraline at a lower dose, or prescribe a different drug that does not interact with CYP2C19.

Despite pharmacogenomics being an area of study since the 1800s, it is currently an underused prescribing tool.[3-4] Estimates for the number of individuals who have completed PGx testing are not provided in the literature. Throughout 2015 to 2018, 48.6% of Americans were taking at least one prescription drug, 24% were taking at least three prescription drugs, and 12.8% were taking at least five prescription drugs.[5] Despite the widespread use of prescription drugs, studies show that medications are only able to produce the desired effect in 50% to 75% of patients.[6] Additionally, the Food and Drug Administration (FDA) notes that the fourth leading cause of death is adverse drug reactions.[7] Pharmacogenomics is a useful tool to address these concerning statistics by helping minimize drug prescriptions that are not effective or that may cause side effects.

The FDA has shown their support for pharmacogenomics by incorporating it into their drug application evaluations.[8] Currently, the FDA recognizes more than 300 drugs with pharmacogenomic guidance in their labeling.[9] Additionally, various PGx databases have been created to make this information readily available to healthcare professionals. The Clinical Pharmacogenetics Implementation Consortium (CPIC) is a group dedicated to increasing the use of pharmacogenomics by offering guidance on the use of PGx results.[10] This resource, and others like PharmGKB and the Dutch Pharmacogenetics Working Group (DPWG), offer information on the most up-to-date drug-gene interactions

available.[11-12] Although the U.S. government and various prestigious research bodies are supportive of pharmacogenomics and the development of comprehensive pharmacogenomic databases, testing is still underused in the healthcare system.

Interest and research in PGx has increased recently. The number of cost-effectiveness studies is increasing, but the primary focus of most studies is to simply identify a gene-drug association.[13-14] And despite moderate evidence of financial benefits, the test might still be considered too expensive for some patients. Pharmacogenomic tests vary widely in price and could cost $250 to over $2,000 in out-of-pocket costs for the member, if not covered by insurance.[15-18] Additionally, healthcare professionals have their own concerns when it comes to pharmacogenomics. Prescribers often feel unfamiliar with pharmacogenomics and therefore are not routinely applying it in their practice.[1] Member and prescriber concerns might stem from a lack of education on the subject. Members might be undecided about the benefits of pharmacogenomics if their prescriber is not confident in applying it in their practice.

Pharmacy benefit managers (PBMs), such as Navitus Health Solutions, have recently begun to offer PGx testing as a benefit to their members. Navitus has partnered with a precision medicine company to allow members to be tested on 27 different genes. The genes correlate to various CYP enzymes and transporters within the body, which are involved in the metabolism of over 100 different pharmacogenomics-testable medications. Pharmacogenomics-testable medications are those with pharmacogenomic prescribing guidance. The test results are made available to the member and their health care provider and can be used immediately to adjust the member's current drug regimen. The results can also be used in the future to choose the best medication and dose, since DNA does not change over time. To initiate the process, the member is mailed a PGx test invitation. If they are interested in participating, they register online and request a cheek swab kit. The cheek swab kit is sent directly to their home and is then mailed back to the precision medicine company. That company processes the sample and offers a genetic counseling session to the member to explain the test results. Lastly, a Navitus pharmacist uses the test results and the member's formulary to determine whether any recommendations can be made to improve the member's drug regimen. Those recommendations are sent to the member's health care provider, who is encouraged to use their clinical judgement and knowledge of the patient's medical history to determine if any changes should be made to the member's medications and treatment plan.

Currently, only a handful of studies are available in the literature that describe the patient or member experience with PGx testing, while the majority of studies focus on the opinions of health care providers.[19-24] Understanding the patient or member experience will help determine the benefits of PGx testing, and the perceived barriers that might keep members from engaging in PGx testing. Prior to this study, only the experience of Navitus PGx pilot program participants were tracked.[25] Those members in the testing pilot reported that 94% were satisfied with the program overall; 83% found the program to be beneficial to their health; and 75% shared the results with a health care provider. The purpose of this study is to continue to collect the opinions of members of two commercial client populations who were involved in a pharmacogenomic testing program led by a pharmacy benefits manager, as well as the opinions of members who declined testing. Results will be used to improve the member experience and highlight best practices for providing a PGx testing program.

Methods

Study Design

This descriptive research survey was approved by the SSM Health Wisconsin Institutional Review Board as well as Navitus population health pharmacists, project management staff and the Navitus compliance and privacy officer. On October 28, 2020, an anonymous survey was mailed to members of two commercial clients who were previously invited to participate in the PGx testing program in the past year. In an effort to increase response rates, the survey was mailed on two additional occasions (November 6 and November 17, 2020). The survey indicated that it should only be completed and mailed back one time per member and to disregard if the member has completed it previously. This anonymous survey was exempt from collecting informed consent, as no identifying information was collected from subjects who participated in the survey. Subjects were not incentivized in any way for their participation.

Survey

The anonymous member survey questions were created based on previous patient-focused surveys in clinical pharmacy literature, but are unique to this study due to the need to assess specific elements of the program offered by Navitus Health Solutions.[19-24] Estimated time to complete the survey was three minutes or less for both members who completed PGx testing and members who declined.

The first question was used to determine if the member completed PGx testing or not. If their answer was yes, the survey instructed members to continue to questions 2 through 6. If their answer was no, the survey instructed members to skip questions 2 through 6 and go straight to question 7. Questions 2 through 6 were used to determine the member's opinion of the cheek swab directions, their understanding of pharmacogenomics, their plan to discuss the results with a health care provider, their understanding that the results should be used by a health care provider for medication prescribing purposes, and if they would recommend this PGx testing program to others. These questions were measured using a 5-point Likert scale (5 – strongly agree; 4 – agree; 3 – neutral; 2 – disagree; 1 – strongly disagree; 0 – not applicable) to measure the degree to which they agreed with each statement.

Question 7 was only answered if the member indicated that they did not complete PGx testing. This final question was used to determine the member's reasons for declining the test.

Members who did not complete PGx testing were asked to select all that applied from a list of potential reasons, including:

- Being unaware of the benefits of the test
- Concerns about personal health information being used
- The cost of the test
- Concerns about the insurance company's use of the results
- The testing process being too difficult
- Their medications are already well-

managed
- Their doctor didn't recommend genetic testing
- They forgot or didn't have time to be tested
- They already completed the test

See Figure 1 for the complete survey

Study Sample

The study included two cohorts: 122 members who completed PGx testing as of September 4, 2020, and 300 members who declined the test as of the same date, for a total of 422 members. All members who completed PGx testing and met the inclusion criteria were invited to participate in the survey study. Inclusion criteria included subjects who were at least 18 years old, a commercially insured member of one of two clients participating in the Navitus PGx testing program, previously invited to participate in PGx testing, and taking a minimum of two or five (depending on client) pharmacogenomics-testable medications in the previous 90 out of 180 days prior to being invited to participate. For members who declined the test, a list of 1,302 alphabetic member names was compiled, from which every fourth member was selected for the study population using block randomization for a total of 300 members.

Exclusion criteria included Medicare members and those not meeting the inclusion criteria.

Statistical Analysis

Descriptive analyses including frequencies of the response categories, means and standard deviations were calculated for survey questions 1 through 6. Qualitative data was collected for question 7 and frequencies were calculated on common themes that were identified. Microsoft Excel was used to graph the outcomes. Additionally, the number of responses received per each of the three mailings was identified.

Results

Of the 422 members who were mailed the survey, responses were received from 59 out of 122 (48.4%) members who completed PGx testing and 50 out of 300 (16.7%) members who declined the test for an overall response rate of 25.8%. No surveys were excluded from the final results.

FIGURE 1. Membership Survey

If you have completed this survey previously, please disregard this mailing.

Navitus Health Solutions Member Survey on Pharmacogenomic Testing

		Yes, go to #2	No, go to #7				
1)	Did you complete genetic testing using the RightMed® test?	O	O				
		strongly agree	agree	neutral	disagree	strongly disagree	N/A
2)	The directions for obtaining a cheek swab were easy to follow.	O	O	O	O	O	
3)	I understand how my genes impact the way my body responds to medications after talking to a genetic counselor.	O	O	O	O	O	O
4)	I have discussed, or plan to discuss, my results with my healthcare provider(s).	O	O	O	O	O	
5)	I believe that the RightMed® test can help my doctor choose the best medication for me.	O	O	O	O	O	
6)	I would recommend the RightMed® test to others.	O	O	O	O	O	

Thank you for completing this survey.

7)	If you DID NOT PARTICIPATE in the RightMed® test, please indicate your reason(s) why by selecting all that apply:	☐ I don't understand the benefits of being tested. ☐ I have concerns about my personal health information being used. ☐ The test is too expensive. ☐ I have concerns about what my insurance company will do with the results. ☐ The testing process seems too complicated. ☐ My medications are already well-managed. ☐ My doctor did not recommend that I complete genetic testing. ☐ I forgot or didn't have time to get tested. ☐ I was already tested or plan to be tested using a different genetic test. ☐ Other

Thank you for completing this survey.

The first mailing yielded 61 responses, while the second and third mailings yielded 35 and 13 responses, respectively.

Most members who completed PGx testing agreed or strongly agreed with each survey statement: test directions were easy to follow (96.6%), they understand PGx after meeting with a genetic counselor (70.7%; 1 member indicated this statement was not applicable), they plan to discuss the results with their doctor (82.4%), the test can help doctors choose medications (70.7%), and they would recommend the test to others (69%).

See Table 1 for specific question response means and standard deviations.

For members who declined PGx testing, the most common reasons were concerns about personal health information being used (36%), other unlisted reasons (30%), concerns about what the insurance company will do with the results (28%), and their medications are already well-managed (28%). See Figure 2 for additional reasons members chose to decline PGx testing.

Discussion

There have been a number of surveys completed by health care professionals related to pharmacogenomics, but not as many have focused on patients, members of an insurance plan, or the general population. This survey was able to demonstrate that members who complete PGx testing have a positive perception of the program and the value it provides. Conversely, members who declined PGx testing have various concerns about sharing

TABLE 1. Survey Responses from Members Who Completed PGx[a] Testing

Question	Mean	Standard Deviation
2) The directions for obtaining a cheek swab were easy to follow.	4.71	0.527
3) I understand how my genes impact the way my body response to medications after taking to a genetic counselor.	3.81	1.131
4) I have discussed, or plan to discuss, my results with my healthcare provider(s).	4.05	0.953
5) I believe that the RightMed® test can help my doctor choose the best medication for me.	3.97	0.898
6) I would recommend the RightMed® test to others.	4.03	0.936

strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1, N/A[b] = 0
[a]Pharmacogenomics, [b]Not Applicable

their genetic information, and they don't fully understand the benefits of the test results. Similar results have been seen in previous pharmacogenomics-related studies including subjects who did and did not complete PGx testing.[19-24]

This survey indicated that 41 members (69.5%) reported a better understanding of pharmacogenomics and their results after discussing the test results with a genetic counselor. According to a 2017 survey (Olson et al.) of 1,010 subjects who received their PGx results, 26% said they somewhat understood their results while 7% said they did not understand them at all.[23] These participants were only provided a mailed copy of their test results and educational materials to explain pharmacogenomic testing. The Navitus PGx program excels in this area because of the connection to genetic counselors who can verbally answer pharmacogenomics-related questions for the member.

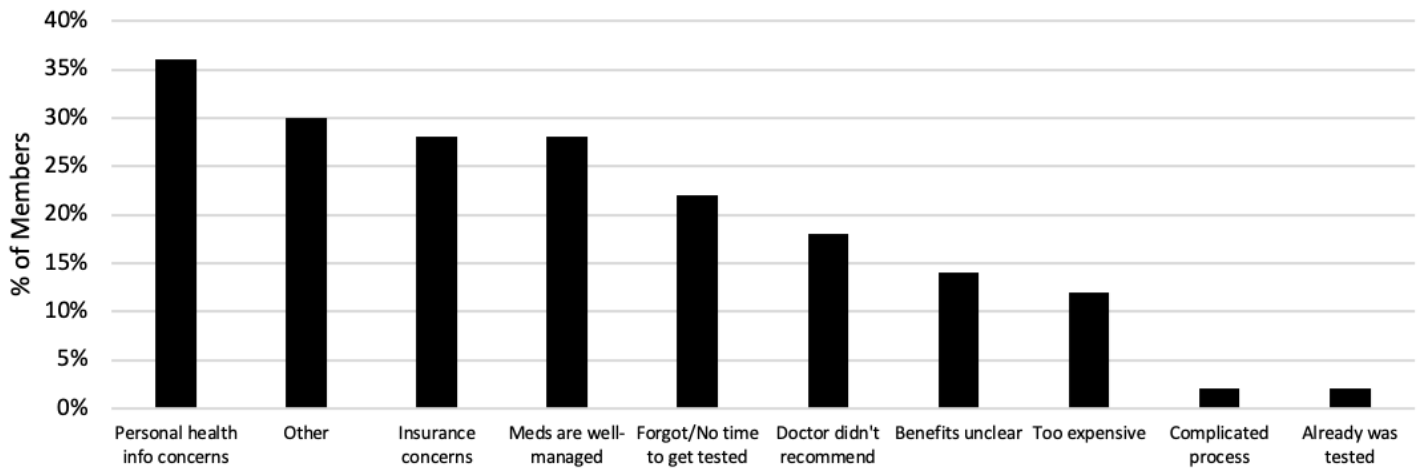
In 2018, another survey (Lemke et al.) was conducted online and included 57 patients, in which most indicated that PGx testing is a helpful tool for their health care providers and they understood what the results meant.[21] Some participants from the same study had concerns about what would be done with their results in terms of privacy and discrimination. These participants, as well as many participants from the Navitus survey, were not familiar with the Genetic Information Nondiscrimination Act, which was put in place in 2008. The act enforces appropriate use of patient genetic information and was specifically aimed at employers and insurance companies.[26]

Another concern that this survey identified was that 6 members (12%) thought the test was too expensive, indicating that they were not aware that the test is offered at no cost to them. In 2017, a small anonymous online survey (Gibson et al.) reported that 81% (27 respondents) said they were interested in pharmacogenomic testing, but would be even more likely to complete the test if they knew their insurance would pay for it.[20] The PGx benefit is offered at no cost to members, but it appears that the Navitus test invitation doesn't highlight this point enough for some members.

The goal of conducting the survey was to use its findings to improve member education and experience. The first step in implementing the feedback was to reconstruct the member PGx testing invitation to address various member concerns identified by the survey. The invitation now includes content about who will be notified of the results, in order to address the concerns about personal health information and what Navitus does with the information. Additionally, a statement was added specifying that insurance copays and coverage will not be adjusted based on genetic results, in accordance with the Genetic Information Nondiscrimination Act. Another piece of information that is now highlighted is the importance of using the test results for future prescribing, since 14 members (28%) indicated that they didn't complete the test because their medications are working well for them at this time. Lastly, a section was created that clearly outlines the benefits of completing the test to address the 7 members (14%) who were unsure of the benefits, including that the test is offered at no cost to the member.

A limitation of this study is that the survey was anonymous; therefore, it is unknown if any member completed the

FIGURE 2. Reason for Declining PGx Testing



survey more than once. Additionally, because all responses were anonymous, it was not possible to compare and contrast the characteristics of respondents, such as the number or types of medications they take. Another limitation is that the survey was sent out in late 2020, but some members were invited to complete PGx testing as far back as late 2019, so they might have forgotten about the invitation to be tested. On the other hand, other members may have received their results and had more time to act on them compared to members who were tested closer to the survey date. Lastly, for members who selected "other" as a reason for declining PGx testing, the member was not instructed to explain; therefore, we were unable to determine what that other reason was.

Further research on pharmacogenomics programs is needed to continue to grow the use of this personalized medicine tool. It would be helpful to determine the provider's perception of pharmacogenomics and how it may have an impact on the member's perception.

Conclusion

Results suggest that most members who completed PGx testing can identify the intended benefits. For members who declined, the survey demonstrated that the test invitation does not adequately address their concerns. Results will be used to continuously improve member education and experience, and highlight best practices for PGx testing programs.

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PR *This article has been peer-reviewed. The contribution in reviewing is greatly appreciated!*

Disclosure: The authors declare no real or potential conflicts or financial interest in any product or service mentioned in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria. The corresponding author has full access to all data collected in the study and takes responsibility for the integrity of the data and accuracy of the data analysis.

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