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ARTICLE

Primary care providers' perspectives on receiving opportunistic genomic results from a national study: The Million Veteran Program Return Of Actionable Results (MVP-ROAR) Study

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ABSTRACT

Purpose: Patients are increasingly obtaining genetic health information and integrating it into their care with the help of their primary care provider (PCP). However, PCPs may not be adequately prepared to effectively utilize genetic results. Across the Veterans Health Administration health system, the Million Veteran Program Return Of Actionable Results-Familial Hypercholesterolemia (MVP-ROAR-FH) Study clinically confirms and returns genetic results associated with familial hypercholesterolemia (FH), identified in a national biobank program.

Methods: PCPs who received their patient's genetic results through the MVP-ROAR-FH study were invited to participate in semistructured interviews, which explored PCPs' familiarity with FH, how the results affected medical management, and suggestions for process improvement. Interviews were transcribed and analyzed using directed content analysis and constant comparison methods to identify key themes.

Results: Interviews with 9 PCPs revealed varied levels of familiarity with genetic testing and FH. Most PCPs did not distinguish FH from common high cholesterol issues and already used similar treatment approaches. Many PCPs did not recall receiving results from the MVP-ROAR-FH study. Alerts in medical records were deemed effective for communicating results. PCPs valued genetics in informing patient care and identifying at-risk family members but noted several implementation barriers, such as additional workload and unclear medical management benefits. Recommendations for improving results disclosure included simplifying the genetic testing report and associated support documents.

Conclusion: The study represents the first investigation into PCPs' experiences with receiving genetic test results from a biobank linked to a national healthcare system. Results suggest that PCPs generally view genetic testing as beneficial, although they may not significantly alter medical management. PCPs expressed that integrating genetics into routine care may be burdensome and require additional training, which may not be practical. The study underscores

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the need for accessible genetic information, which could be aided by specialized support roles or different clinical specialties assisting with incorporating genetic results into patient care.
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Introduction

Genomic testing has historically been indication based, used diagnostically to evaluate a patient's clinical presentation or family history. Now, individuals increasingly have opportunities to receive health-related genomic results through direct-to-consumer or research offerings, cascade screening recommended as a result of their relatives' genetic results, or secondarily from expanded genomic testing ordered for other clinical indications.[1-4] The expanded access to and decreasing costs of genomic testing have given rise to the possibility of both opportunistic genomic screening, the interrogation of existing genomic data for clinically important genomic results, and population genomic screening, the proactive screening of an unselected patient population for such results.[5] The American College of Medical Genetics and Genomics has recommended a list of genes for opportunistic screening and the return as secondary findings from clinical exome and genome sequencing.[6] In contrast, population genomic screening is not widely recommended by clinical guidelines or professional societies, but there is growing interest in population-wide genomic screening for certain conditions that are sufficiently prevalent, highly penetrant, and clinically actionable to justify their widespread detection and management.[7-12] Indeed, recent modeling studies suggest that population screening for 3 conditions—hereditary breast and ovarian cancer, Lynch syndrome, and familial hypercholesterolemia—may be cost-effective at the societal level.[13,14]

As genomic testing expands beyond specialty diagnostic care into opportunistic and population screening, primary care providers (PCPs) will find themselves on the front line of this new clinical paradigm. Many PCPs have limited experience with genetic or genomic testing, although primary care guidelines call on PCPs to offer certain tests when indicated, such as those for *BRCA1/2* variants or preconception carrier screening.[15,16] Studies have reported that PCPs feel unprepared for and unsupported in helping their patients interpret and manage genomic results, particularly if they were not the ordering provider.[17,18] Nevertheless, PCPs value their primary role in managing and coordinating their patients' care and desire systems that support the appropriate interpretation and management of genomic results.[19,20] On one hand, they appreciate delegating certain clinical tasks to other staff members or technological platforms to streamline procedures[12,13]; on the other hand, they wish to remain sufficiently informed to effectively direct their patients' care.[21]

In this context, it is crucial to understand PCPs' perspectives on receiving unanticipated yet actionable genomic results for their patients and on the processes that can support them in managing these results appropriately. Despite expressing limited bandwidth to integrate genetic research results into clinical practice, PCPs remain central in managing multiple facets of their patients' care. To better inform the future integration of genomic testing and screening into primary care, we conducted an interview study among a national convenience sample of PCPs who received unexpected opportunistic results for their patients participating in a megabiobank and national return-of-results pilot project.

Materials and Methods

MVP-ROAR Study

This interview study is a substudy of the Million Veteran Program Return Of Actionable Results (MVP-ROAR) Study, described previously.[16] In brief, the MVP is a national biobank that, to date, has enrolled more than 1 million US military veterans, who complete surveys, provide DNA specimens, and consent to the research use of their medical record data.[22] Within MVP, MVP-ROAR is a pilot trial among participants whose MVP research genotype data suggest that they carry a pathogenic variant associated with familial hypercholesterolemia (FH). The MVP-ROAR Study thus modeled a type of opportunistic genomic screening, albeit through participation in a research biobank instead of as a part of clinical genomic testing. FH was selected as the exemplar genetic condition for MVP-ROAR because it is recognized by the American College of Medical Genetics and Genomics as a reportable secondary finding, has been proposed for population genomic screening, and has associated cholesterol-lowering treatment guidelines easily implementable by PCPs.[6,23,24] The MVP-ROAR Study implemented an intervention adapted from the report by Sturm et al and convened by the Familial Hypercholesterolemia Foundation (2018).[25] MVP participants with a potential FH-associated variant were recontacted by the MVP-ROAR genetic counselor and invited to undergo confirmatory clinical gene sequencing and posttest genetic counseling, including provision of FH-related informational resources and facilitation of cascade testing for at-risk family member. Each participant's PCP was also sent the results via email, along with an FH treatment algorithm[24] and a letter summarizing their patient's results.[26] No action was required from PCPs by the study; however, they were encouraged to discuss the result and management recommendations with their patients. The study genetic counselor was available as an ongoing resource to both participants and PCPs.

PCP interview study

To capture PCPs' perceptions, preferences, and needs regarding the receipt of clinical genomic results, we conducted a qualitative interview study among a national convenience sample of 9 PCPs who had received clinical gene panel sequencing results from the MVP-ROAR-FH study for at least 1 of their patients. The analytic team included 1 genetic counselor student (A.L.J.), 3 genetic counselors (M.E.D., C.L.P., and H.L.G.), and 1 medical anthropologist (K.E.S.). The Veterans Health Administration (VA) Central Institutional Review Board approved this substudy to the MVP-ROAR protocol (#19-11). We followed the COREQ (COnsolidated criteria for REporting Qualitative research) Checklist in reporting the study results (Supplemental COREQ Checklist).

Participants and recruitment

PCPs were eligible to participate in the interview substudy if (1) they practiced primary care at a VA location, (2) their patient received genetic test results through the MVP-ROAR Study, and (3) the patient had completed the end-of-study survey. To recruit our sample, study staff (A.L.J. and M.E.D.) invited all eligible PCPs whose patients had received results and completed study procedures at the time to participate using emails and internal institutional instant messages.

Interview design and data collection

We set out to understand (1) the impact of receiving these genomic results on patient care, (2) PCPs' comfort and preparedness in discussing these results with their patients, (3) perceived facilitators and barriers to receiving results within a clinical research framework, and (4) the suggestions for improving the results communication process. Our interview guide was created through an iterative process using a priori constructs from the Consolidated Framework for Implementation Research,[27] which offers researchers a basis for understanding potential barriers and facilitators to successful implementation[28] of new initiatives (Supplemental Interview Template). A 2-person team (A.L.J. and M.E.D.) conducted semistructured interviews using video software, Microsoft Teams, from August 2023 to February 2024. Researchers took detailed written notes during the interviews, and all interviews but 1 were audio recorded and transcribed verbatim. In the sole case of PCP 3, for which the interview was not audio recorded, researchers used their notes in place of a transcript. Because PCP receipt of original genomic results occurred a median 13 (range 2-34) months before this substudy, each PCP was resent their patient's genetic testing results report, the summary letter explaining the implications of the patient's results, and the FH treatment algorithm before their interview. The interviews asked PCPs about their (1) familiarity with FH, (2) experience receiving results through the MVP-ROAR Study, (3) discussion of results with patients, (4) recommendations for improving the MVP-ROAR Study results communication process, (5) general impressions of genetic testing, and (6) facilitators and barriers of genetic testing both within the MVP-ROAR Study and more broadly. We also collected information about demographics, including whether PCPs had received any formal or informal genetics training. Interviews lasted approximately 30 minutes.

Data analysis

We conducted a directed content analysis[29,30] to understand how PCPs experience the receipt of results and implement and/or discuss these results with their patients who have participated in the MVP-ROAR program. The analytic team consisted of 5 members (A.L.J., M.E.D., K.E.S., H.L.G., and C.L.P.). Using a rapid qualitative analysis approach, coders (A.L.J. and M.E.D.) reviewed the interview notes and sorted interview data into a matrix based on a priori categories[18] created using Consolidated Framework for Implementation Research and feedback from coauthors. One researcher (K.E.S.) advised on the analytical approach. Two additional researchers (H.L.G. and C.L.P.) assisted the coders with creating iterative summaries of the categorized data across interviews. Summaries were reviewed for consistency and differentiation.[31] The full analytic team met regularly to discuss data, refine the approach, and add emergent categories drawn from the data about PCPs' experiences and the barriers and facilitators they encountered when engaging with the MVP-ROAR program because not all data collected fit within the a priori categories.[32,33] We also used constant comparison methods when reviewing data summaries to identify and understand the breadth of PCP experiences as they received genomic test results from the MVP-ROAR program. Meta-themes arose after analyzing 6 transcripts, with thematic saturation, the point at which no new themes emerged from our data, following shortly after. This was possible due to the narrow study focus on the return of FH results within the confines of the MVP-ROAR program and the associated PCP responsibilities.[34-36] Our team reached consensus on the final data categorization, data summaries, and interpretation through weekly analysis meetings. Engaging all members of the analytic team (A.L.J., M.E.D., C.L.P., H.L.G., and K.E.S.) in these meetings also reduced bias in data interpretation. Results were shared with all coauthors at regular study meetings, who provided additional refinement of the results interpretation.

Results

At the time of the interview study, 64 patients had completed study procedures, cared for by 57 unique VA PCPs. Contact attempts by enterprise email (Microsoft Outlook) or messaging (Microsoft Teams) were undeliverable for 4 of these, and 1 additional PCP was on parental

leave. Of the 52 PCPs contacted, 11 responded with interest, 9 of whom ultimately completed interviews. Among these 9 interviewees, 6 had practiced primary care for at least 15 years, and 7 reported no additional genetics training beyond the typical medical school curriculum (Table 1). They practiced in VA facilities across 7 states (Figure 1). The following themes emerged from these interviews.

Familiarity with genetic testing and FH

Most reported having no previous formal or informal genetics training; some discussed attending occasional genetics educational talks hosted by the VA, often related to the VA National Pharmacogenomics Program (formerly the PHASER program).[37] PCP familiarity with FH varied. Although some were familiar with FH given their own family or patients' histories, many did not distinguish it from multifactorial high cholesterol: "…I don't actively differentiate in terms of if [high cholesterol is] familial, we just diagnose and treat hyperlipidemia…" (PCP 8). Regardless, PCPs expressed confidence in treating high cholesterol and hyperlipidemia, some describing these conditions their "bread and butter" (PCPs 1 and 6).

Experience receiving results

Most PCPs did not recall receiving their patients' MVP-ROAR Study results via email, although they reported that this would generally be an effective way to receive such results. PCPs noted that the result report was too lengthy, contained confusing medical jargon, and was "difficult to read." If they did remember receiving the results package, PCPs reported that it did not affect their management of the patient's clinical care, for which they reported they already use similar treatment algorithms. One provider, with 21 years of experience, felt that the results and accompanying resources might be helpful to early-career PCPs or to those less familiar with the difference between multifactorial high cholesterol and FH; another provider felt that the information about clinical and family implications seemed particularly useful because of implications for cascade testing. One provider described the treatment algorithm as helpful and planned to use it when treating other patients.

Impact of MVP-ROAR results

The PCPs reported that the FH results did not affect their care of MVP-ROAR participants. Many reported already effectively managing their patients' cholesterol levels before receiving results, including having discussions with patients about medication changes, dietary recommendations, family histories, and referrals to specialists. One PCP asked, "What is the benefit of doing the testing if I'm not changing any management?" (PCP 9). PCPs generally agreed that receiving genetic testing results could theoretically inform medical management and treatment of patients, identify at-risk family members, or provide access to novel, targeted treatments but recognized the potential limitations of prescribing within the VA:

> "The difficulty, at least in the primary care sector, is just fighting all the noise about medications and treatment of [FH or other lipid disorders]…you start getting into treatment and that's where a lot of resistance comes into play, because [patients] hear about statins, which are typically the first line, and here at the VA, PCSK9 inhibitors require authorization." (PCP 2).

Some PCPs, unsurprised by their patients' genetic results, expressed gratitude for finally having an explanation for why their patients' cholesterol levels were challenging to treat and responded poorly to statins. However, FH test results were unexpected but welcome for a PCP who gained new perspective about 1 of their patients: "I actually think it's great… for this particular patient, I was definitely not aware of this diagnosis [… so this] helps me to focus a little bit more on another problem she has that I was less aware of" (PCP 5).

Table 1 Characteristics of 9 primary care providers interviewed about their experiences receiving genomic results from the Million Veteran Program Return Of Actionable Results Study

Characteristics	*n* (%)
Gender	
Male	3 (33)
Female	5 (56)
Not provided	1 (11)
Race	
White	3 (33)
Black or African American	1 (11)
Asian	4 (44)
Not provided	1 (11)
Years in primary care	
<10 y	3 (33)
10-14 y	0 (0)
15-19 y	1 (11)
20-25 y	2 (22)
>25 y	3 (33)
Years working for VA	
<10 years	5 (56)
10-19 years	2 (22)
20-30 years	1 (11)
>30 years	1 (11)
Region of VA facility	
Southeast	4 (44)
Northeast	2 (22)
Midwest	1 (11)
West	2 (22)
Genetics training beyond medical school	
None	7 (78)
Reported some	2 (22)
Individual patient results received	
1	8 (89)
2	1 (11)

VA, Veterans Health Administration.

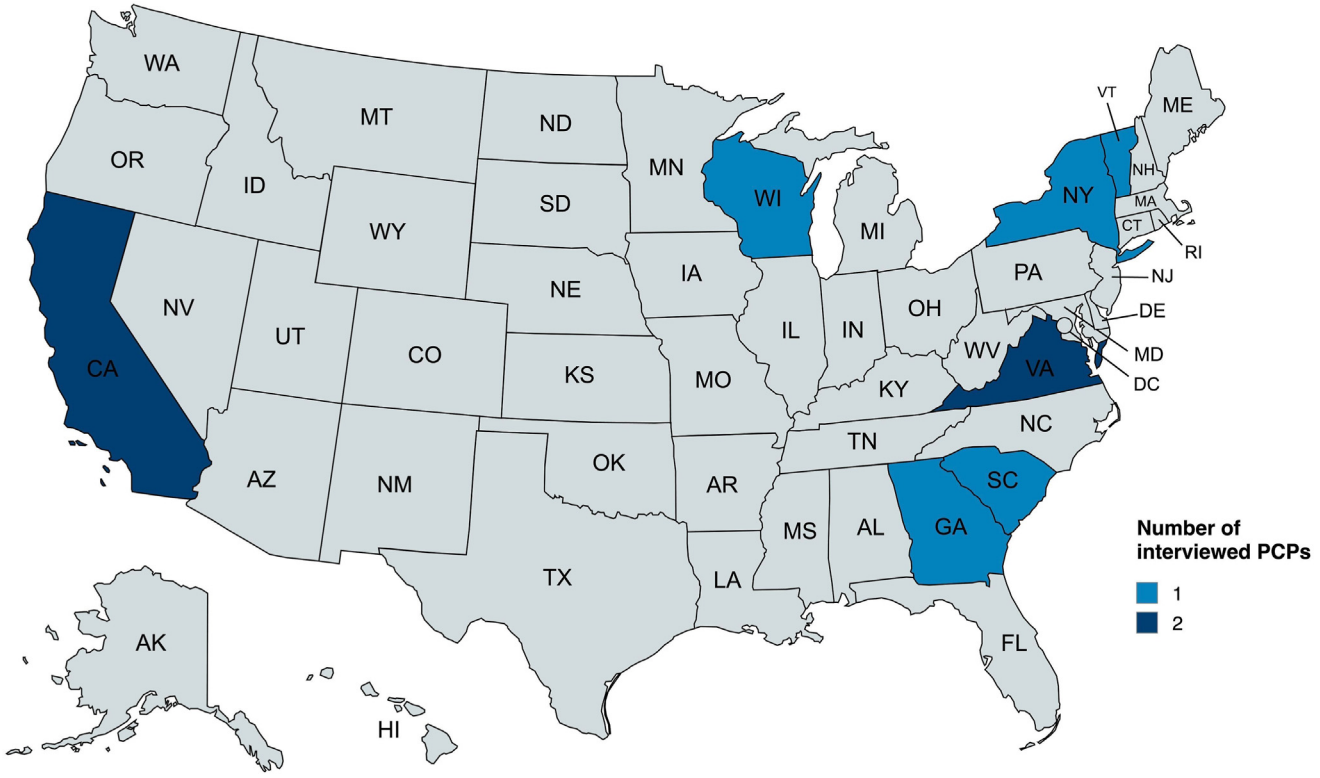

Figure 1 VA locations of 9 primary care providers interviewed about their experiences receiving genomic results from the Million Veteran Program Return Of Actionable Results Study. PCP, primary care provider; VA, Veterans Health Administration.

Management of FH may involve referral to specialists if elevated cholesterol levels remain or are especially treatment resistant. One provider described referring "patients who need more [advanced management] to cardiology," although they mentioned knowing "what to do with statins" and managing most of their hyperlipidemia patients in primary care (PCP 4). When caring for patients who did not respond sufficiently to usual statins, PCPs reported they most commonly referred to cardiology and lipid specialists, although some PCPs also referred patients to endocrinologists and clinical pharmacists.

Expanding the return of results

PCPs saw theoretical value in receiving genetic testing results for FH and stated interest in seeing genetic results disclosure expanded to other conditions, especially hereditary cancers, diabetes, and hypertension. One provider shared, "I think this is where medicine is headed … I think this genetic pathway is something that we should be pursuing a lot more aggressively" (PCP 2). Another provider, who sees only female patients, said their patients would "welcome that extra eye on them, especially for family history or [if] they're stressed out about [the hereditary components of breast cancer]" (PCP 1). Other benefits of expanded return-of-results programs include providing evidence to support PCPs' clinical recommendations, encouraging patients to remain adherent to their screenings or treatments, and motivating patients to make positive lifestyle changes. Additionally, negative results may alleviate patients' concerns about developing a familial condition: "If I can give them a negative result or something not to worry about, that really helps with the mental health, and [PCPs] spend a lot of time dealing with the mental health aspect." (PCP 1).

Discussions of how valuable expanded genetic results disclosure could theoretically be paired with discussions of barriers to implementing the expansion of a program such as MVP-ROAR. PCPs were primarily concerned with adding more time-consuming work into their already hectic workloads because they are "…so, so busy, so overwhelmed" (PCP 6). This feeling was exacerbated by concerns about whether genetic test results might "[translate] to better clinical care" while "add[ing] more work to providers" (PCP 8) because they were uncertain how test results might directly affect medical management of patients for most conditions. PCPs largely felt they did not have expertise to identify appropriate testing candidates, order testing, or interpret and disclose results. In addition, time constraints during appointments limit PCPs' ability to include conversations about genetic testing:

> "[In] primary care we have 20, 25 different complaints to take care of with limited time, like 30 minutes. So, we don't get to explore more…sometimes we [schedule their next

appointment] sooner and have that discussion; sometimes, we end up calling them after hours and talk about it." (PCP 6).

Providers described mixed patient views of genetic testing, from interested to ambivalent to hesitant. They generally agreed that most patients who may have reason to consider genetic testing (ie, personal or family history of disease) seem interested or at least open to pursuing genetic testing, particularly surrounding cancer risks. Alternately, PCPs reported some patients' negative views of genetic testing and concerns about privacy, discrimination, or undue stress, fear, and uncertainty about potential future symptoms as additional barriers to expanding test results disclosure. One provider described, "It could cause great stress knowing that you have a genetic disorder. Some people don't want to know if they'll get a disease, others want to know and try to prevent it, or look for it, so every person's different," (PCP 7). One PCP cautioned that genetic testing should only be done on individuals who are presumed to be affected because general population screening may cause unnecessary fear; another thought expansion should only include later-onset conditions for which some level of prevention can be implemented. Additionally, 3 PCPs cited financial concerns as reasons patients outside the VA may not be receptive to genetic testing: "…We would have never entertained technology like this in private practice because [of the] cost and insurance companies wouldn't pay for it" (PCP 1). PCPs were concerned that insurance coverage (or lack thereof) may leave patients with a hefty bill or limited access to genetic testing or necessary follow-up procedures.

Recommendations for improvement

PCPs disagreed about whether additional resources included in the results disclosure package might be helpful to them. Some mentioned a desire for additional education and support in managing FH patients, such as continuing medical education sessions provided by the genetics department, whereas others were unsure if they would utilize resources because of time constraints. PCPs wanted future return-of-results packages to include minimal jargon, be in an easy-to-read layout with the most important information first in a clearly labeled main section, and make clear what information is supplemental and not critical for medical management. They stated that the organization of the documents was crucial, so that PCPs would not spend time reading extraneous information or miss more important information located elsewhere in the results document. Alerts in the medical record, which are prominently displayed within the software, were identified as the most effective way to communicate genetic test results to PCPs. Alerts are available to each of the patient's providers, even if the patient receives care from providers at multiple VA locations. PCPs generally agreed that email, VA internal instant messaging, and mail could be used to communicate test results if necessary

Discussion

This study examined PCPs' actual experiences receiving their patients' opportunistic genomic results for a penetrant monogenic condition from a biobank linked to a national integrated health care system. PCPs generally reported clinical benefit in receiving positive FH-associated variant results. In contrast, they paradoxically did not find that the results necessitated changes in their patients' medical management, particularly in cases in which they perceived that they had already been effectively managing their patients' hypercholesterolemia. PCPs also highlighted the time-constrained nature of their primary care practice as a barrier to integrating genetics into routine clinical care. They recommended that future genomic screening initiatives might be enhanced through the communication of results and easy-to-understand supportive information via common clinical communication methods, such as internal email and instant messaging and electronic health record (EHR) alerts. They suggested that additional genetics training or continuing education might be beneficial but also infeasible with their demanding clinical schedules. With supports in place, PCPs perceived value in receiving genomic results from an expanded list of conditions beyond FH.

Previous studies have examined PCPs' perspectives on receiving unsolicited genomic results, but these have generally been hypothetical in nature.[38-41] For example, in an interview study at 4 health care systems preparing to participate in large-scale return-of-results project, physicians responded in the abstract about the need for actionability, evidence-based management plans, and clinical decision support when receiving unsolicited genomic results for their patients.[39] At another health care system preparing to return genomic results to biobank participants, a survey of PCPs indicated they had a desire to receive results, preferably by EHR or letter but that the majority wanted a genetics specialist to be involved in communicating results to patients. Still, about half reported that the PCP should share the responsibility of discussing the results.[40] This study extends this work by interviewing a national sample of PCPs after they had received real genomic results for at least 1 of the patients in their primary care panel. Perhaps because of this real experience, PCPs in this study did not express theoretical concerns about the program but instead focused more on how to improve the implementation of such a program into busy primary care practice.

These findings thus have practical implications for future genomic screening programs for FH specifically and other genomic conditions more generally. Recent guidance from the International Atherosclerosis Society confirms the importance of early universal FH screening through cholesterol testing, ideally beginning in childhood. This guidance recommends multiple FH detection strategies, including selected, opportunistic, and universal screening using phenotypic and genetic testing but acknowledges

limited experience to date with "genotype-first" opportunistic or population genomic screening for FH.[23] The MVP-ROAR Study does not model isolated opportunistic genomic screening because the majority of VA primary care patients are middle aged or older and undergo regular lipid panel testing.[42,43] Nonetheless, this analysis provides insight for how PCPs might react to and need support in managing their patients' opportunistic genomic results. Many, but not all, VA patients with hypercholesterolemia or elevated cardiovascular disease risk receive adequate therapy and achieve target low-density lipoprotein cholesterol levels.[44-46] This may explain the perception among PCPs interviewed in this study that an FH-associated genomic result would not significantly change their clinical management of carriers. However, evidence from the VA and other health care systems suggests that patients with an FH phenotype may go undetected and undertreated[45,47,48] for their level of cardiovascular disease risk. To realize the benefits of intensive lipid lowering for patients with a molecular diagnosis of FH, let alone the benefits of cascade testing among their relatives,[49,50] genomic screening programs will need to communicate the importance of distinguishing between FH and more common forms hypercholesterolemia and support PCPs in making clinical decisions based on those distinctions. Moreover, the distinction between diagnostic, indication-based genomic testing and genomic screening should be better communicated, in light of PCP comments that negative results in the MVP-ROAR context would be reassuring.

When asked about the expansion of genomic screening to additional conditions, PCPs in the present study indicated that screening for hereditary cancer risk would be beneficial. This preference may stem from the comparative difficulty of assessing cancer risk, which unlike hypercholesterolemia with a readily measurable biomarker, relies on data such as detailed family histories that are more challenging to collect and interpret comprehensively in the time-constrained environment of primary care practice. Although not asked specifically, this finding might indicate acceptance of screening for other highly penetrant monogenic conditions considered for opportunistic or population genomic screening, such as hereditary breast and ovarian cancer and Lynch syndrome. Nonetheless, PCPs in this and other studies consistently report feeling inadequately prepared and lacking sufficient time to independently receive, interpret, and manage genomic screening results.[40,41] To address these challenges, novel service delivery models, such as delegation of some tasks to ancillary staff, traditional or electronic consult services, or other population management strategies, have been implemented in various health care systems to facilitate genomic medicine care.[51,52] Respondents in our study appreciated that certain tasks were managed by members of the research team, including the study genetic counselor; further work should explore their preferred roles for genetic counselors and ancillary staff in genomic screening. Digital tools might also play a role in supporting both the patient and PCP in appropriate management.[53-56] A combination of these and other approaches will likely be essential for the meaningful integration of genomic screening into primary care. Health care systems should include frontline PCPs in the codesign of workflows and support systems for future genomic screening initiatives.

The strengths of this study includes its report on the actual experiences among a national sample of PCPs receiving real genomic screening results. Limitations include that the views of the PCP participants are not necessarily generalizable to all PCPs who received results from the MVP-ROAR Study or to all PCPs in general; participants indicated willingness to be interviewed about their experiences with the study, which may indicate that they were more willing to integrate genomic screening into their care or that they had strong opinions about the program. However, the variation among participants' responses, demographics, and practice length and location suggests that we captured a range of opinions and experiences, a goal of qualitative research seeking to inform implementation.[57] Moreover, we took steps to reduce and address bias (eg, constant comparison in data analysis and regular discussions of data collection and analysis approaches as a team). Second, in the MVP-ROAR Study, genetic results were sent to PCPs via email; this method of communication within a national integrated system was perceived to be acceptable for this study by PCP participants but is at odds with the best practice of having genetic results reported directly through the EHR. Although the MVP-ROAR intervention was adapted from published guidelines and resources,[24,25] further understanding PCPs workflow preferences will help improve future versions. Third, there was a prolonged period of time between some PCPs' receipt of their patients' results and their interviews; we thus resent the patients' results and supporting materials to the PCP participants before the interview. This likely increased the informativeness of the interviews, but it is unknown whether the interview responses elicited by this method reflect their initial reactions to receiving the results. Finally, most of the PCP participants received results for only 1 patient, and their experiences might thus not represent a future where PCPs more commonly receive patients' genomic results.

Conclusion

This study underscores the practical need for enhanced support and infrastructure in genomic screening within primary care. If PCPs are to navigate the complexities of integrating genomic results into patient management, clear communication and support systems including collaborative care approaches are essential for the effective use of genomic data in improving patient outcomes. Moving forward, health care systems must prioritize the development of

integrated strategies that address PCPs' concerns and workload, facilitating the broader application of genomic screening in routine clinical practice.

Data Availability

Redacted transcripts will be available on request.

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Author Contributions

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Ethics Declaration

The VA Central Institutional Review Board approved this study. All participants gave informed consent.

Conflict of Interest

Kurt D. Christensen was supported by a research grant from Sanford Health. Amy C. Sturm was an employee of 23andMe, Inc. All other authors declare no conflicts of interest.

Additional Information

The online version of this article (https://doi.org/10.1016/j.gim.2025.101416) contains supplemental material, which is available to authorized users.

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