

Organizational Characteristics of Veterans Affairs Clinics With High and Low Utilization of Clozapine

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Objective: Twenty to thirty percent of patients with schizophrenia experience treatment resistance. Clozapine is the only medication proven effective for treatment-resistant schizophrenia. However, in most settings less than 25% of patients with treatment-resistant schizophrenia receive clozapine. This study was conducted to identify facilitators of and barriers to clozapine use to inform development of interventions to maximize appropriate clozapine utilization.

Methods: Seventy semistructured phone interviews were conducted with key informants of clozapine processes at U.S. Department of Veterans Affairs medical centers in various U.S. regions, including urban and rural areas, with high (N=5) and low (N=5) rates of clozapine utilization. Interviewees included members of mental health leadership, psychiatrists, clinical pharmacists, and advanced practice nurses. Interviews were analyzed by using an emergent thematic strategy to identify barriers and facilitators related to clozapine prescribing.

Results: High utilization was associated with integration of nonphysician psychiatric providers and clear organizational processes and infrastructure for treatment of severe mental illness, for example, use of clozapine clinics and mental health intensive case management. Low utilization was associated with a lack of champions to support clozapine processes and with limited-capacity care systems. Obstacles identified at both high- and low-utilization sites included complex, time-consuming paperwork; reliance on a few individuals to facilitate processes; and issues related to transportation for patients living far from care facilities.

Conclusions: Implementation efforts to organize, streamline, and simplify clozapine processes; development of a multidisciplinary clozapine clinic; increased capacity of existing clinics; and provision of transportation are reasonable targets to increase clozapine utilization.

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Schizophrenia is one of the most disabling disorders. Although effective treatment is available, 20% to 30% of patients do not respond to at least two antipsychotic medications and are deemed to have treatment-resistant schizophrenia (1). Clozapine has been proved superior to other antipsychotics for treatment-resistant schizophrenia (2–4).

Evidence-based treatment guidelines and U.S. Department of Veterans Affairs (VA) policies agree that patients who do not respond to adequate trials of two antipsychotics should be offered clozapine (5–10). However, clozapine is associated with side effects including significant weight gain, diabetes, and myocarditis (11,12). Because clozapine is also associated with a risk of agranulocytosis, the U.S. Food and Drug Administration (FDA) monitors use of the drug through a mandated risk evaluation and mitigation strategy (REMS) program. The FDA REMS program requires registration of the physician, patient, and pharmacy as well as frequent monitoring and reporting of absolute neutrophil counts (ANC) (11,12). Monitoring and reporting of white

blood cell counts were part of the program when it began but are no longer required.

Thus clozapine is both uniquely effective and uniquely inconvenient, creating an imperative to use the drug as much as possible and a “bother” factor that induces clinicians to avoid its use. Therefore, clozapine underutilization by clinicians may persist, in part, because of the increased complexity of prescribing clozapine compared with other antipsychotics. However, rates of clozapine utilization vary between facilities, suggesting that it is possible to achieve higher clozapine utilization rates despite these challenges (13,14).

Because clozapine is prescribed for a small minority of patients, most patients with treatment-resistant schizophrenia receive less effective antipsychotics (13–16). Others receive supratherapeutic antipsychotic doses and polypharmacy with antipsychotics other than clozapine, strategies generally found to be less effective than clozapine (13,16–19). Thus owing to the underuse of clozapine, the most vulnerable patients are being prescribed less effective treatment. It seems worthwhile,

therefore, to consider how clozapine use might be increased, despite the known challenges.

Although there is no consensus on what proportion of patients should be treated with clozapine, all patients with treatment-refractory schizophrenia should be offered clozapine unless there is an absolute contraindication, such as history of myocarditis or clozapine-induced agranulocytosis (20). Estimates indicate that up to 30% of patients with schizophrenia are considered treatment resistant, but not all patients with treatment-resistant schizophrenia are appropriate candidates for or are willing to take clozapine. Therefore, one could estimate that the percentage of patients with schizophrenia who use clozapine should approach 20%. Indeed, one study reported that 69% of patients with treatment-resistant schizophrenia, roughly 20% of all patients with schizophrenia, accepted clozapine treatment when offered (20). However, clozapine utilization rates of less than 5% were reported in multiple settings (13,14,18,19). Although the challenges of complying with the clozapine REMS program and the drug's side effect profile undoubtedly contribute to low utilization, nationwide VA data indicate that some sites approach 20% utilization, despite these challenges (15). Thus low utilization rates may not lie solely in patient refusal or contraindications to clozapine.

Therefore, we conducted a qualitative study to identify facilitators of and barriers to clozapine use at VA sites with the highest and lowest rates of clozapine utilization. A focus on outlier sites has the potential to identify strategies that are both effective and at least moderately feasible, given that some sites have already succeeded in adopting them (21–23). Identifying effective strategies for use of clozapine, in turn, can help inform a feasible and effective strategy for implementing changes to improve clozapine utilization more broadly.

METHODS

Conceptual Model

The Consolidated Framework for Implementation Research (CFIR) and an emergent thematic analysis strategy were used to inform our research and to develop interview guides and for high- and low-utilization sites (24–29). CFIR is composed of five domains (intervention characteristics, outer setting, inner setting, characteristics of individuals involved, and process of implementation) as well as 39 constructs and subconstructs that allow researchers to systematically identify and track barriers and facilitators related to change in complex medical systems (27,28). Framing the research with CFIR assisted in designing and conducting a rigorous assessment of organizational characteristics of sites (29).

Study Sites

Using fiscal year [FY] 2013 VA prescribing data, facility-level rates of clozapine utilization for patients with schizophrenia or schizoaffective disorder were calculated at each VA facility. The denominator was the total number of patients at

the site with a diagnosis of schizophrenia or schizoaffective disorder (*ICD-9* code 295.x), and the numerator was the number of those patients who received clozapine from a VA pharmacy during FY 2013. When this definition was used, clozapine utilization across the entire VA system was 4%. Five sites with high utilization and five sites with low utilization were asked to participate. Personnel at sites with zero utilization of clozapine were not contacted because they might not be able to contribute useful information. Sites generally differed in size, geographic region, complexity, and urbanicity. This type of diversity was easier to accomplish with low-utilization outliers because of the many sites fitting that description. Sites were not informed of their utilization status.

Key Informants

Purposeful and chain referral sampling approaches were used to identify participants with expertise related to clozapine prescribing, policy, and practice (30,31). The chief of psychiatry at each site was contacted to identify potential participants. Potential participants identified by the chief were contacted to request their participation and to ask them to identify potential participants involved in local clozapine policies, processes, and prescribing (chain referral sampling). Chain referral sampling was also used to confirm that interviewees were considered by staff to be experts on clozapine policy and practice (32,33). Participants were divided into leadership figures and frontline clinicians. Leadership figures may not directly prescribe or manage clozapine but are involved in creating, influencing, or implementing policies or managing departments integral to clozapine processes (laboratory, information technology, psychiatry, and pharmacy). Frontline clinicians, such as psychiatrists, advanced practice nurses, and clinical pharmacists, were directly responsible for prescribing or managing patients receiving clozapine.

Interviews

Semistructured telephone interviews were conducted between September 2014 and May 2015. Participants provided informed consent prior to the interview. Interview guides were informed by CFIR and relevant literature (27,28). Interviews focused on perceptions of clozapine risks and benefits, local and national clozapine policies and processes (formal and informal), departmental interfaces regarding clozapine utilization, sources of clozapine policies and procedures, and patient perceptions of clozapine.

Data Analysis

Coding and analysis of interview transcripts were completed by experts in qualitative research methods (RLE and MBM) and experts in medicine and psychiatry with qualitative research experience (JLG and AJR). All coders conducted interviews. The codebook was developed by using inductively informed grounded thematic analysis (24–26). The finalized codebook identified broad themes relating to

“domains” regarding clozapine beliefs, policies, practices, and processes. Once the codebook was finalized, interrater consensus was reached through an iterative process with four interviews coded by all four team members. The remaining interviews were coded by one investigator except for two interviews coded by all four to ensure continued interrater reliability. Each investigator coded interviews from different sites and job roles. Next each facility was assigned to one investigator, who independently reviewed all coded interviews for that site and synthesized data into a profile of that site’s organizational structure, clozapine management policies and procedures, and beliefs related to clozapine. Thus interviewee data were triangulated to allow provider perceptions of individual and organizational structures and processes of care to be analyzed and contextualized within sites and across sites.

Tables containing representative quotes from sites were developed for each domain. Finally, looking across site profiles, the team identified thematic domains that defined the differences between high- and low-utilization sites. All data were coded and analyzed by using NVivo 10. This study was approved by the Edith Nourse Rogers Memorial Veterans Hospital Institutional Review Board.

RESULTS

Seventy participants were interviewed at five sites in the top 10% for clozapine utilization (greater than 8% of patients with schizophrenia used clozapine) and five sites with lower than median utilization (less than 4% of patients with schizophrenia used clozapine). Table 1 lists the key informants by profession. Table 2 describes characteristics of the sites, by level of utilization of clozapine.

Five thematic domains related to clozapine utilization were identified (Table 3). Domains were conceptualized on the basis of potential to develop interventions unique to each domain. Each domain is discussed in detail below, with Table 4 providing representative quotes for each domain.

Transportation

The most pervasive issue affecting clozapine utilization was patients’ needs and resources related to transportation for weekly visits and laboratory monitoring. A lack of reliable transportation was mentioned by informants at low- and high-utilization sites, even at sites located in environments with adequate public transportation. Reasons cited included inability by disorganized patients to navigate public transit, paranoia about riding public transit, and cost of transportation. Patients who lived far from care facilities were not considered clozapine candidates, regardless of clinical need, because of perceptions that they could not attend weekly visits. Sites with higher clozapine utilization often had greater availability of transportation services, for example, a van to bring patients to appointments. Transportation services were often located within mental health intensive case management (MHICM) services; although all sites had

TABLE 1. Number of key informants interviewed about use of clozapine at U.S. Department of Veterans Affairs facilities, by profession

Informant	N
Mental health leadership	11
Pharmacy leadership	5
Psychiatrist	22
Clinical pharmacist specialist	12
Advanced practice nurse	4
Dispensing pharmacist	9
Laboratory staff	3
Other ^a	4
Total	70

^a Includes registered nurse, clinic coordinator, medical technologist, and social worker

MHICM, the proportion of clozapine patients enrolled in MHICM was higher at high-utilization sites. However, even high-utilization sites struggled to provide clozapine for patients living far from the facility.

Capacity

Clozapine prescription requires multiple administrative processes, including registration of physician, patient, and pharmacy; review of informed consent; and weekly visits. Thus there must be adequate clinician availability to accommodate increased visit frequency and to complete required paperwork, processes, monitoring, and reporting. Staff at low-utilization sites cited increased prescriber burden as a primary barrier to clozapine utilization.

Informants at both high- and low-utilization sites expressed concerns about the site’s capacity to accommodate increased prescribing burden associated with clozapine. Even among high-utilization sites, only three achieved clozapine prescribing rates of 10% or higher. Low-utilization sites reported that limited capacity prevented meaningful clozapine use. High-utilization sites often reported that the clozapine clinic was functioning at or above capacity.

Multidisciplinary Teams

The issue of multidisciplinary teams emerged from the analysis of capacity as a related but independent thematic domain. For this theme, data were captured and analyzed on the use of nonphysician providers as well as the gaps and strains experienced at sites that relied solely on physicians.

High-utilization sites addressed capacity issues in part through integration of nonphysician staff into the clozapine team. Advanced practice nurses and clinical pharmacists completed clozapine-related tasks—for example, registration, ordering and monitoring laboratory tests, and evaluating side effects. Low-utilization sites relied on physicians to complete these tasks. Informants at low-utilization sites expressed a need for more clinical pharmacists in mental health care in general, especially to facilitate the use of clozapine.

TABLE 2. Characteristics of VA facilities with high and low rates of utilization of clozapine among patients with schizophrenia

Facility	Clozapine utilization (%) ^a	Patients with schizophrenia (N)	Region	N of interviewees ^b	Clozapine clinic	Multidisciplinary team	Significant transportation support
High rate							
A	10	590	Midwest	8	✓	✓	✓
B	8	1,080	Northeast	7	✓	✓	✓
C	15	290	Midwest	12	✓	✓	
D	10	450	West	7	✓	✓	✓
E	9	660	Southeast	4	✓	✓	
Low rate							
F	2	550	Northeast	6	✓	✓	
G	4	1,170	West	9	Limited ^c	✓	
H	1	450	Southeast	8			✓
I	2	1,510	Southeast	6			
J	3	1,830	Midwest	3			

^a Rates are based on fiscal year 2013 VA prescribing data.

^b Semistructured telephone interviews were conducted with key informants at each clinic between September 2014 and May 2015.

^c Clozapine clinic had limited capacity and rigid rules regarding seeing patients outside clinic hours; many clozapine patients were treated by individual clinicians outside the clinic.

Care Coordination

Although all providers were required to follow the REMS monitoring parameters, the process of care was significantly different at high- and low-utilization sites. For example, high-utilization sites often had a clearly defined point person or clinic system to organize clozapine care. Multiple entities, including the clozapine registry and the psychiatry, laboratory, and pharmacy departments, all played a role in clozapine prescription, necessitating considerable coordination among the departments and often between the providers and the patient or patient’s family. In addition, these steps must be taken in a specific sequence within narrow timelines. High-utilization sites addressed these issues through development of clozapine clinics to coordinate care.

Clozapine clinics were largely defined by the presence of multidisciplinary teams, adequate time to accommodate increased visit frequency, and dedicated support staff. Clozapine clinics were seen as integral to providing clozapine care, with informants at high-utilization sites reporting being unable to imagine providing clozapine without a clozapine clinic.

Although having a clozapine clinic was beneficial, it nonetheless limited patient access. Once the capacity of a clinic was reached, a decision to expand the clinic needed to be made, often by adding a clinic session, requiring allocation of additional resources. Treating additional patients outside the clinic, however, resulted in a much greater burden for physicians.

TABLE 3. Thematic domains affecting use of clozapine among patients with schizophrenia at VA facilities

Thematic domain	Definition
Transportation	A multifaceted issue related to the need for transportation to frequent medical visits. Domain directly related to the distance to and from medical centers as well as the distance between community-based outpatient clinics and major medical centers
Capacity	Multiple reasons account for sites’ ability, or lack thereof, to prescribe clozapine. Domain directly related to staffing and scheduling issues
Multidisciplinary teams	Availability and incorporation of nonphysician staff affected sites’ ability to initiate patients on clozapine treatment as well as to prescribe clozapine for patients maintained on clozapine
Care coordination	Oversight of the clozapine-prescribing process was a key component in sites’ ability to use clozapine. Domain related to whether the use of clozapine had one or more champions, whether there were clear processes for use of clozapine, and whether the people “in charge” of clozapine could be readily identified
Overreliance on a few staff members	Utilization of only a few people to facilitate clozapine processes left systems vulnerable when key personnel were away or unavailable

Maintaining adequate psychiatric staff was an ongoing issue for many facilities, but particularly for low-utilization sites. Frequent staff turnover was reported by some as a barrier to the continuity of care necessary to ensure coordination of clozapine treatment.

Another barrier was the accumulation of many small process delays, which added up to bigger delays for patients. At some facilities, a weekly clozapine visit was an all-day affair because of delays in drawing blood, processing laboratory results, conducting clinic visits, and dispensing the prescription or because of limited access to transportation. Lack of coordination made it difficult to accommodate patients who lived far away and had difficulty getting to the medical facility on clozapine clinic days. High-utilization sites were more flexible in terms of scheduling outside clinic hours, offering walk-in hours or same-day appointments.

TABLE 4. Representative quotes by key informants for thematic domains affecting use of clozapine at VA facilities with high and low rates of clozapine utilization among patients with schizophrenia

High utilization	Low utilization
Transportation	
<p>"[Intensive case management staff] are either able to go and get them and bring them into clinic, or if they are residing out in an assisted living facility, we can coordinate with the facility to bring them in. All our [intensive case management] veterans do have a lot more supports in place to help them get into Clozaril Clinic without difficulty." (clinical pharmacist, site D)</p>	<p>"[It's true that] not that many people like getting blood draws. . . . [But] the frequent appointments, the distance, a lot of people come from an hour away and just the logistics of coming in for frequent monitoring sometimes is an issue. The side effects don't usually seem to be the factor." (psychiatrist, site I)</p>
Capacity	
<p>"We had to tell [the] inpatient team to stop referring to [the] clozapine [clinic] . . . because we were at capacity. So there were these two solutions—give us [staffing for] another day or we'll have to start discharging patients." (pharmacist, site B)</p> <p>"I have a Clozapine Clinic on Tuesday morning, and then I have . . . quite a bit of overflow on Mondays and I do it as a walk-in clinic." (psychiatrist, site C)</p>	<p>"People [staff] have full schedules; we are a huge facility and for a certain time over the past two years we grew up faster than we were able to record people and so there was time when people [didn't] have a next available appointment for another 3 or 4 months and I think availability and accessibility is definitely a factor and this is why [we are developing a] Clozaril Clinic, trying to diffuse . . . that . . . barrier." (mental health leadership, site I)</p> <p>"I think it's a very effective medication. In fact, I say when nothing else works, clozapine definitely will work, and it does keep 'em out of the hospital. I don't know that we have the staff that can monitor the face-to-face follow-up that is really needed." (nurse practitioner intensive case management, site H)</p>
Multidisciplinary teams	
<p>"We have a number of different people in the clinic. . . . We have one psychiatrist, Dr. [name omitted], who is head psychiatrist over at the clinic. It's managed by a nurse, who keeps tabs on the patients who are supposed to be coming in for that day and prints us out a list of who those patients are. I serve as a provider in the clinic and we have another psychiatrist who serves as a provider, and then when we have residents, we have them serve as providers for clinic. We meet together in the morning, and we're given the list of patients that we'll be seeing for that day, and then it's kind of an open clinic so the patients show up at their leisure. . . . If I were to see a patient because I cannot write Clozaril orders, I would see the patient, do my evaluation and assessment, and then I would [discuss the patient] with our chief psychiatrist and make my recommendations and then . . . Dr. [name omitted] decides whether to take our recommendations or not and then puts in the orders for the patients." (clinical pharmacist, site D)</p>	<p>"Once we had a clinical pharmacist on board, it made managing patients on clozapine . . . and getting new starts much, much easier. . . . I basically would recommend that every mental health outpatient clinic have a [mental health] pharmacist assigned to them to help manage [clozapine] patients." (psychiatrist, site G)</p>
Care coordination	
<p>"I think that it would be helpful to have a specific clozapine clinic with providers who are more familiar with [clozapine] . . . [and people] who have the time to sit down with the patient and arrange for all of their lab appointments and their med renewals and everything . . . have somebody who focuses on that because it is time consuming. There's a lot of paperwork and stuff that goes along with it." (clinical pharmacist, site C)</p> <p>"It worries me when . . . there's not somebody coordinating it. . . . If we didn't have our clinic downstairs I don't know how any of these guys could stay on track. I really don't know how that would work. So if there are VAs that don't [have a clozapine clinic], I can't imagine how they're doing [prescribing clozapine]. But maybe it's a requirement. Like I said . . . I'm not sure." (pharmacist, site A)</p>	<p>"I don't know that I could treat more patients . . . who are on clozapine because it's so labor-intensive. . . . I have to worry where they are and track them down and make sure they come in. Has a blood test been ordered? Are their appointments in the computer? Is there somebody here to draw their blood? I mean, there [are] so many details that have to be seen to. . . . It just doesn't all happen by itself." (social worker, site F)</p> <p>"Monitoring patients new to clozapine is kind of hard to do, especially when you're busy with a whole bunch of other patients. Checking to make [sure] their labs are okay and then writing the prescription every single week, I don't feel like I could have many patients on that kind of regimen." (psychiatrist, site G)</p>

continued

TABLE 4, continued

High utilization	Low utilization
Overreliance on a few staff members	
<p>"[The clinical pharmacist] is trying to do everything good and smooth. . . . does a phenomenal job, goes out of their way, is always accessible. This person leaves a phone number, even [when] traveling . . . so I can't really tell you . . . how smooth it [would go] without this person." (pharmacist, site E)</p> <p>"He does [play an integral part]. If he's not there and the nurse . . . [isn't] there I can sometimes get in his drawer and figure out where things are or go through the process that we use [to prescribe clozapine]." (psychiatrist, site A)</p>	<p>"[The other staff] just wait until I get back [from vacation]. . . . There've been a couple of times when it's been delayed . . . several days, even up to a week." (clinical pharmacist, site G)</p>

Overreliance on a Few Staff Members

This domain reflects a systems and processes issue noted at high- and low-utilization sites. Although having committed clozapine champions was essential, it was not sufficient to ensure access to clozapine. Many sites relied on one or two staff members to complete clozapine-related tasks. However, overreliance on too few people left sites vulnerable when staff were away because of illness, annual leave, or retirement. Even high-utilization sites were vulnerable in this way, although they usually relied on three or four people, rather than one or two, as was the case at low-utilization sites.

DISCUSSION

We interviewed key informants at facilities with high and low rates of clozapine utilization to understand what specific factors prevented or facilitated clozapine utilization. Via triangulation of key informant data within and across sites, we identified actual barriers versus barriers that are only perceived. Through this analysis, we found that high-utilization sites had commonalities, among them providing access to transportation; having sufficient capacity to enroll patients; utilizing multidisciplinary teams, including non-physician providers; conducting better coordination of care; and creating systems to reduce reliance on too few individuals.

These findings suggest that establishing clozapine clinics staffed by multidisciplinary teams given adequate time to accommodate the increased visit frequency and prescribing burden of clozapine could improve access to evidence-based care for patients with treatment-resistant schizophrenia. This objective would include development of clozapine clinics at sites without one and expansion of existing clozapine clinics. Within clozapine clinics, clearly defined clinical structure and staff roles may improve the effectiveness of clinics (34). In addition, this study suggests that the straightforward act of providing transportation to and from clozapine appointments has the potential to greatly expand the pool of patients who would be able to receive this potentially life-changing medication. Home visits have been a

successful tool for some clozapine programs and could also address access-to-transportation issues (20).

There have been other, similar studies using qualitative interviews of outlier sites to gain insight into how to organize care to achieve the best results (22,23). Some of our findings echo earlier studies. In particular, previous studies reported that adequate staffing and effective integration of nonphysicians into patient care are key ingredients in the success of other programs, including programs as diverse as anticoagulation clinics and hospital teams caring for patients with acute coronary syndromes (22,23). In a study of clozapine patients, multidisciplinary teams were associated with improved medical monitoring (35). Thus a more effective use of multidisciplinary teams could improve access and outcomes across a multitude of settings.

One of the strengths of this study was the focus on strategies that work well within the current system and rules rather than on ideas that rely on changing those rules, which may not be possible (20). Monitoring requirements vary by country, but many countries have similar requirements, making this study relevant across health care systems. Although all of the changes or initiatives suggested by this study may be permissible under current rules, some of these changes would require a commitment of resources. However, data suggest that incremental increases in clozapine utilization would be associated with cost savings. Thus increased outpatient costs may be outweighed by cost savings from reduced inpatient hospitalizations (36,37). A study described in a companion article (38) demonstrated that incremental increases in clozapine utilization could result in substantial cost savings, primarily through decreased use of inpatient admissions. Thus implementation of interventions derived from this study could more than pay for themselves, if they succeeded in increasing clozapine utilization for treatment-resistant schizophrenia.

Patients who lived far from clinics were a unique and difficult group to reach and were not well served, even by the highest-utilization sites studied. This means that a fairly large subset of patients essentially had no access to clozapine. Some of the solutions discussed above would help to reach this population as well. The most feasible solution would involve providing transportation or home-based care

to patients who lived far from clinics, which would admittedly be more expensive and laborious than providing these services to patients living closer. Other solutions, for example, increased use of outside laboratories or point-of-care testing for blood count monitoring, would be difficult to implement within VA, because they may require national policy change. However, point-of-care testing should be considered, given that clozapine patients consider it more convenient and less painful than traditional venipuncture (39).

This study had some limitations. First, the VA limits clozapine prescribing to psychiatrists and neurologists. Thus some obstacles encountered in the VA may not be an issue for other care settings. Second, telephone interviews may be suboptimal in some cases, in part because the interviewers may miss nonverbal cues and because it is difficult to develop rapport over the phone. However, many of the interviews lasted much longer than anticipated, suggesting that participants felt comfortable sharing their experiences. In addition, surveys of clinicians have reported similar findings (40). Third, our definition of high utilization may not reflect optimal utilization, which has not been defined. Last, VA sites may not be representative of other health care systems.

However, the same side effects, FDA REMS requirements, and low utilization associated with clozapine prescribing at the VA also affect outside providers, suggesting that other systems must overcome challenges similar to those faced by the sites we studied. That is true even in light of the changes to the clozapine REMS program (such as authorization from the clozapine REMS program before dispensing clozapine and reporting of ANC only), which still require registration of physician, patient, and pharmacies; frequent monitoring; and limitations on days supplied (11). These interventions may prove useful in other countries with similar monitoring requirements.

CONCLUSIONS

Using qualitative research methods, we examined differences between VA sites with the highest and lowest rates of clozapine use. We found that a number of strategies being pursued by outlier sites with high rates of clozapine prescribing would be feasible to implement in a broad variety of settings. These strategies include starting a clozapine clinic where none exists, ensuring that clozapine clinics have sufficient capacity to handle all the patients for whom clozapine is indicated, providing transportation to all patients receiving clozapine, and ensuring adequate staffing and integration of nonphysician clinicians in clozapine clinics. Although other strategies for improving utilization of clozapine could also be considered, in many cases they would require national-level policy changes that could prove challenging to pursue. Used in combination, and pursued diligently, the more feasible strategies identified in this study would likely be sufficient to reach the goal of providing clozapine to all appropriate patients.

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