Pharmacy Technicians and Point of Care Testing

Journal of Pharmacy Technology
2015, Vol. 31(4) 143–148
© The Author(s) 2015
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/8755122515579106
pharmatech.sagepub.com

Megan E. Keller, PharmD, BCACP¹, Sarah E. Kelling, PharmD, MPH, BCACP²,
and David R. Bright, PharmD, BCACP³

Abstract

Objective: As the practice of pharmacy continues to advance and involve nondispensing pharmacy services, point-of-care testing (POCT) has continued to demonstrate its usefulness as a tool and service in pharmacy. Of particular significance is the ability of POCT to assist clinical practice related to diabetes, cholesterol management, and anticoagulation. POCT can allow for certain laboratory results to be obtained within seconds to minutes, which can help direct care. Many components of POCT programs can involve pharmacy technicians to help enhance practice efficiency. The purpose of this review is to provide an overview of POCT devices commonly used in nondispensing pharmacy services and to describe the roles that pharmacy technicians may have in the POCT process. **Data Sources:** PubMed (1946-2014) was reviewed for relevant literature using terms such as “pharmacy technician” and “point of care testing.” Additionally, manufacturer information/websites of POCT products were reviewed for approval information and instructions for use. **Study Selection and Data Extraction:** Articles describing POCT completed in a pharmacy setting and/or roles of pharmacy technicians and related support staff in the POCT process were considered for inclusion. **Data Synthesis:** Several types of POCT devices for different uses common to the practice of pharmacy are reviewed. Additionally, strategies for collaboration between pharmacy technicians and pharmacists in the execution of a POCT program are described. **Conclusion.** Pharmacy technicians are well suited to participate in portions of the POCT process, and the involvement of pharmacy technicians may improve POCT efficiency.

Keywords

point-of-care testing, pharmacy technician, nondispensing services

Introduction

Point-of-care testing (POCT) has shown to be a very useful tool in many areas of pharmacy practice, especially as it relates to testing surrounding diabetes, cholesterol management, and anticoagulation.¹⁻³ Use of POCT allows for the clinician to obtain objective laboratory results within seconds to minutes, often while working directly with the patient. The short time that the test takes may allow for timelier medication changes in situations such as diabetes management, which can be helpful during the patient encounter.¹ Furthermore, opportunities are expanding for pharmacy practice to include additional POCT, including related to infectious diseases, creatinine levels, and pharmacogenomics.⁴⁻⁶

Pharmacy technicians are experiencing expanding role definitions in the pharmacy world.⁷ Evidence exists to show a need for pharmacy technicians to be involved in nondispensing patient care opportunities, such as medication therapy management (MTM), through a variety of functions that includes POCT.⁸⁻¹⁰ Despite recognition that pharmacy

technicians can be involved in nondispensing pharmacy services, little literature exists to delineate specific ways that technicians can be involved in the POCT process, and little direction is available for those who want to streamline a POCT process in a pharmacy by pharmacist and pharmacy technician collaboration. However, the knowledge that the pharmacy technician possesses regarding basic medication use, common disease states, and patient care workflow may reinforce the pharmacy technician as an ideal collaborator for such activities. The purpose of this review is to provide an overview of POCT devices commonly used in nondispensing pharmacy services and to

¹Doctors Hospital Family Practice, Grove City, OH, USA

²The University of Michigan, Ann Arbor, MI, USA

³Ferris State University, Big Rapids, MI, USA

Corresponding Author:

David R. Bright, PharmD, BCACP, Department of Pharmaceutical Sciences,
Ferris State University, 220 Ferris Dr, Big Rapids, MI 49307, USA.
Email: davidbright@ferris.edu

describe the roles that pharmacy technicians may have in the POCT process.

Data Sources

PubMed (1946-2014) was reviewed for relevant literature using terms such as “pharmacy technician” and “point of care testing.” Additionally, manufacturer information/web-sites of POCT products were reviewed for approval information and instructions for use. Articles describing POCT completed in a pharmacy setting and/or roles of pharmacy technicians and related support staff in the POCT process were considered for inclusion. As the purpose was not to be exhaustively inclusive of all literature, representative articles are notated below to describe potential roles for pharmacy technicians.

Commonly Used POCT Devices

While many opportunities for POCT exist in the community pharmacy, not all pharmacies or health care facilities will operate each type of test. Limitations, such as device cost, reagent storage, recordkeeping, and inventory management, may cause pharmacies to pick and choose carefully when deciding if there is a clinical use and financial market for the POCT service. Below are some of the more popular POCT categories for devices, followed by some direction on the role that pharmacy technicians can serve when it comes to specific POCT devices.

Diabetes Management

Blood glucose, also known as blood sugar, is frequently tested in the community setting. According to the American Diabetes Association, blood glucose can be used to screen individuals for diabetes. For example, patients with no symptoms of diabetes, but who are at an increased risk (eg, being overweight plus having high blood pressure), should be tested for diabetes at least every 3 years.¹¹ Among patients who are diagnosed with diabetes, blood glucose testing can be used to assess diabetes control and to adjust medications.

A wide variety of glucometers are currently available. While each is unique, and the pharmacy technician should review the device-specific protocol for testing, the process for obtaining a blood glucose reading offers general similarities in process and flow. Before testing, a supply of single-use lancing devices should be obtained to obtain the blood sample necessary for testing. Health care professionals should be sure to use only single-use lancing devices to prevent the potential spread of blood-borne pathogens, which could very possibly occur with the use of multiple-use lancing devices. First, insert the test strip into the glucometer. After lancing the cleaned fingertip, or other

location approved by the testing device, a small sample should be applied on the channel of the test strip. The results will appear on the meter within several seconds.

Some glucometers may allow alternate site testing, which some patients may prefer as there are fewer nerve endings in these locations, which can decrease the amount of pain the patient experiences. Common alternate locations include the upper arm, forearm, hand, thigh, and calf.¹² As there are fewer blood vessels leading to these alternate sites, blood glucose readings may lag and reflect values approximately 20 to 35 minutes prior. As a result, alternate site testing should only be used when an individual is expected to have stable blood glucose, such as when waking up in the morning or directly before a meal.

Some glucometers require the use of control solutions, which contains a known amount of glucose and can be used to ensure that the meter is accurate. Control solutions may be used when a new box of test strips is opened, if the glucometer appears to not be working correctly, or if unusual blood glucose results are being obtained.

Incorporation of technology continues to result in increasingly user-friendly glucometers. For example, OneTouch UltraLink can connect with select insulin pumps, while the OneTouch Verio IQ notifies individuals of high and low blood glucose patterns.¹³ The Freestyle InsuLinx glucometer allows the user to log insulin doses as well as personalize the device with pictures and messages.¹⁴ Newer products, such as the iBGStar, allow blood glucose testing to be conducted and recorded using cellular devices, such as the iPhone and iPod touch.¹⁵ Many of these features may be valued more by patients conducting self-testing, as opposed to pharmacy technicians completing POCT in the community pharmacy.

Another method of measuring blood sugar is through hemoglobin A1C, which assesses average blood sugar over the past 3 months. According to the American Diabetes Association, hemoglobin A1C can be used to diagnose and monitor blood sugar control in patients with diabetes.¹¹ Some devices that measure hemoglobin A1C also allow assessment of albumin and creatinine, which helps assess kidney function.

The DCA Vantage Analyzer can be used to measure hemoglobin A1C, albumin, and creatinine. It requires that a small amount patient's blood or urine sample be placed on the corresponding reagent cartridge and the results are analyzed in minutes. Additional supplies that are needed include a control cartridge and lint-free tissues. The DCA Vantage Analyzer must be used at room temperature, including the cartridge, which should be removed from the refrigerator at least 15 minutes before use. Once removed from the refrigerator, cartridges must be used within 60 minutes.¹⁶

The Afinion HbA1C test must be used with the Afinion AS100 Analyzer.¹⁷ The test cartridges must be stored in the

refrigerator and be brought to room temperature before use. The blood sample should be collected using the provided capillary tube and then placed in the test cartridge within 1 minute. The results are available in 3 minutes and 20 seconds.

Cholesterol Management

Conducting POCT cholesterol testing in the community setting may be useful as a screening tool (eg, patients who have not been diagnosed with elevated cholesterol but who may be at risk) when appropriate laws allow the device to be used in such a way. Assessment of the effect of medications and lifestyle changes (eg, healthy eating and physical activity) can also be a valuable use of POCT.

The Cholestech LDX analyzer can be used to measure total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides.¹⁸ If appropriate testing supplies are used, it can also assess aspartate aminotransferase and alanine aminotransferase, markers of liver damage, as well as blood glucose. The analyzer requires that a patient's blood sample be drawn into the corresponding capillary tube and placed appropriately on a test cassette and analyzed for approximately 5 minutes. Additional testing supplies specifically required for this device include Cholestech LDX capillary tubes and plungers. Cholestech LDX analyzers must be used at room temperature, on a stable work surface, and away from direct heat and bright light. Cassettes stored in the refrigerator are stable until the expiration on the cassette pouch. If removed from the refrigerator, cassettes must be used within 30 days.

The Cardiochek PA test system can also be used to measure total cholesterol, HDL-cholesterol, triglycerides, and will calculate the LDL-cholesterol using a small blood sample.¹⁹ Blood sugar can also be assessed if the appropriate test strips are used. The Cardiochek PA test system includes the device, PTS Panels test strips, and a MEMo Chip. The MEMo Chip included in each package of PTS Panels test strips contains settings for the test strips. It is important to only use the MEMo Chip that was included with each package of test strips. The lot number code on the test strip vial, MEMo Chip, and device display must match. The Cardiochek PA and corresponding test strips should be stored at room temperature.

Anticoagulation

Warfarin works to prevent and treat blood clots by increasing the amount of time needed for the blood to clot. It requires frequent monitoring as the dose must be individualized for each patient, and the needed dose may change over time. Prothrombin time measures how long it takes for the blood to clot, and in some cases may be

interpreted/converted clinically as an international normalized ratio (PT-INR or INR). Patients taking warfarin who experience an excessively high or low prothrombin time may be at risk for bleeding or clotting episodes, respectively.

CoaguChek currently has 3 different systems that can be used to measure prothrombin time: CoaguChek XS, XS Plus, and XS Pro.²⁰⁻²² Each system includes a meter, test strips, and a matching code chip. During use, the device should be placed on a vibration-free surface or held horizontally. After lancing, the blood drop should be applied directly to the test strip within 15 seconds. There is an option to connect the meter to a computer or host system running appropriate software to store data without manual entry. There are several built-in quality control functions, such as a check of the test strip temperature while the test is in progress and a check of the expiration date and lot information on the test strip carried out by the code chip. Optional control solution is available.

The Coag-Sense meter also measures prothrombin time.²³ The system includes a portable meter and test strips that contain bar-coding, thus eliminating the need for a code chip. Low hemoglobin or hematocrit, components of red blood cells, do not affect the results. The test requires a 10 μ L blood sample and results are available within 1 minute. Patient home self-testing is also available by physician prescription.

Roles for Pharmacy Technicians

Developing a POCT service requires a considerable amount of preparation.²⁴ In this section, opportunities for technicians to be involved in the process of developing and maintaining the service will be explored. Specific tasks must be completed before the testing service can begin, such as obtaining a CLIA waiver and ensuring other regulatory compliance. Other procedural tasks, such as workflow, patient scheduling, and recordkeeping, must take place on a continual basis.

Obtaining and Maintaining a CLIA Waiver

The Clinical Laboratory Improvement Amendments of 1988 (CLIA) created quality standards for different types of laboratory testing.^{24,25} The Centers for Medicare and Medicaid Services (CMS) manages CLIA regulations as they pertain to laboratories in the United States.²⁶ Even if a pharmacy performs only an occasional blood glucose test in an effort to help with patient assessment or treatment, that pharmacy is considered to be a laboratory under CLIA and must register with the CLIA program.²⁶ CLIA designates different laboratory tests based on a complexity model, where choices are waived, moderate complexity, and high complexity.²⁷

Many basic laboratory tests of relevance to clinical pharmacy services are qualified under CLIA as “waived” tests. Such tests are cleared by the Food and Drug Administration (FDA) and are listed on the FDA’s website.²⁸ Although these tests are of low complexity by their federal designation, testing sites must obtain a CLIA Certificate of Waiver from CMS using CMS form 116. Specific instructions for obtaining the Certificate of Waiver, as well as instructions for appropriate CMS State Agency and Regional Office CLIA contacts, can be obtained online.²⁶ Testing sites that perform only waived tests are, under Federal law, not subject to routine oversight or personnel requirements.²⁷

Once you have obtained a CLIA Certificate of Waiver, it is important to ensure that all appropriate requirements of CLIA are met. CLIA specifically requires that a laboratory pay the certificate fee every 2 years, follow the manufacturers’ instructions for the waived tests, notify the appropriate state agency of any changes in ownership/name/address/director within 30 days, or if there is a desire to add tests of increased complexity, and permit inspections by a CMS agent.²⁷ Further instructions on specifics to these requirements can be found at the CMS website.²⁷ A pharmacy technician involved in the POCT process, under appropriate supervision by a pharmacist, could be responsible for filling out the appropriate application paperwork, for becoming familiar with laboratory rules and regulations to maintain the Certificate of Waiver, and could also take care of processing paperwork for the recurring certificate fee. Of note, the devices reviewed in this article are CLIA waived tests.

OSHA and Regulatory Compliance

The Occupational Safety and Health Administration (OSHA) requires employers to offer their employees a safe and healthy work environment.²⁷ Many pharmacies are already familiar with at least some elements of OSHA due to their experience with immunizations; therefore, many pharmacies may have existing policy and procedure that covers OSHA and related issues.

Pharmacists and pharmacy technicians involved with POCT, especially as it relates to the collection of body fluid samples, should be especially aware of OSHA requirements. One starting point may be to consult the OSHA Bloodborne Pathogens Standard, which would include items such as having a written plan for exposure control, use of Universal Precautions for infection control, use of personal protective equipment (PPE) such as gloves and eyewear, provision of hepatitis B vaccination, safety training, and equipment for the safe handling and disposal of biohazardous waste.²⁷ Policies and procedures for OSHA compliance may already be in place for pharmacists at the pharmacies where they work; however, these policies may not have traditionally extended to technicians if there is not substantial technician participation in services such as

immunizations. Extension of existing policies and procedures to pharmacy technicians that participate in the process may be warranted should participation involve risk of exposure. Additional safety considerations may be made, such as prohibiting the storage of food in refrigerators where testing supplies are stored and prohibiting eating in areas where POCT is performed.²⁷ As mentioned previously, pharmacists and pharmacy technicians should investigate specific regulations as it pertains to local and state standards before initiating POCT in their pharmacy.

Inventory Management

In many community pharmacies, pharmacy technicians may have a substantial role in, or may even have higher levels of responsibility related to inventory management. In that case, it would be a very simple extension of the current procedure for a pharmacy technician to play a significant role in inventory management of the POCT process. For instance, test strips/cartridges/reagents may need to be ordered routinely, especially if the product does not have a long period before expiring. As some testing supplies may be relatively expensive, more frequent ordering may also help reduce costs associated with having a larger inventory; however, this should be balanced against potentially decreased cost with bulk ordering, particularly if multiple locations are providing POCT services.

Test strips, test cartridges, and reagents are by no means the only inventory necessary for the POCT process. Quality control test materials, whether that be an optics check device, a solution, or a specific type of reagent, may need to be ordered on a routine basis. Furthermore, general supplies such as single-use lancets, bandages, gauze, cotton swabs, table coverings, and cleaning supplies may be necessary depending on the individual POCT chosen.

Workflow Management

Many pharmacy technicians are well versed in helping ensure proper workflow in a community pharmacy, especially related to the medication dispensing process. Additionally, some pharmacy technicians may assist with workflow management of nondispensing services, such as immunizations or MTM. Pharmacy technicians assisting with the POCT may help schedule appointments, keeping in mind testing requirements, such as a preference for morning appointments if the test requires fasting for best results.

Pharmacy technicians may help with reminder calls for patients with a scheduled POCT, not only to remind the patient about the time and date of the test but also of the need to bring other paperwork or to fast as necessary. Pharmacy technicians may also help prepare the work site for testing, such as by gathering the necessary supplies for the test, and cleaning the space for testing. On the arrival of

the patient, the pharmacy technician may wish to welcome the patient to the pharmacy, obtain any necessary paperwork for billing or a consent to test, and may give the patient a brief overview of what to expect with the test. In the case where state law allows for the pharmacy technician to perform POCT, the pharmacy technician may perform the test and then ask the pharmacist to help with interpretation of the test and to counsel the patient.

Recordkeeping

Pharmacy technicians familiar with the immunization or MTM process may also be aware of some of the record-keeping needs when providing nondispensing services beyond simply that of inventory management. For instance, recording each quality control test performed may be necessary for proper maintenance of a CLIA Waiver. Instructions for proper use and controls should be included in the package insert of the device, and specific questions should be directed to the company supplying your pharmacy with the POCT device as each device and test is different. However, it should be expected that some element of quality control will be necessary for most tests performed.

The pharmacy technician may be involved with other record keeping needs associated with the POCT visit. For instance, making sure that the patient leaves with a copy of the results and ensuring that all billing paperwork is completed before the patient leaves may be examples of valuable activities to improve workflow. Pharmacy technicians coordinating follow-up visits may be helpful if the pharmacist feels it appropriate to have multiple interventions with the patient. In some cases, the patient or pharmacist may want to be sure that other health care professionals are also aware of the POCT results, and forwarding those results via mail or fax may be helpful. Coordination with other health care professionals in such a manner may be one strategy to help move toward the concept of the medical neighborhood, where community pharmacies performing medical management integrate with other members of the health care team, such as those working at physician offices.²⁹

Additional Considerations

As laws and regulations are continually updated, are different from state to state, and even may differ at the local level, it is very important to seek out specific guidance from applicable sources in your area. For instance, the regional or state Department of Labor office and/or CMS office could help with OSHA and CLIA considerations.²⁴ The state pharmacists association may be able to help with any legal implications in the state or area, where additional regulation may be applicable when it comes to POCT, such as the need for a collaborative agreement or prescription to perform certain tests. Some employers may also restrict POCT due

to liability or job descriptions or union contract regulations, so careful considerations of these issues may be warranted. Finally, pharmacists may need to update their liability insurance if pharmacists involved are performing job functions outside of what is covered in a typical professional liability policy. It may be helpful to consult the specific liability insurance policy or company to determine if nondispensing counseling opportunities (ie, MTM and POCT) require additional liability coverage.

While resources are available to begin stand-alone POCT services, others may find it helpful to offer POCT related to general MTM processes or specific disease-state focused clinical services.^{1-5,24,30} As some emerging opportunities for clinical intervention can create additional clinical and business opportunities, pharmacists and pharmacy technicians should consider if inclusion of POCT could help enhance patient care and business opportunities within the pharmacy.

Conclusions

Pharmacy technicians are well suited to participate in functions in the pharmacy beyond simply supporting the dispensing process. Other auxiliary roles may help increase efficiency and ease workflow considerations in the pharmacy. Pharmacists and pharmacy technicians may find it helpful to consider opportunities to implement POCT in an efficient manner, or revise current procedures to incorporate increased involvement of pharmacy technicians in the process.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: David R. Bright represents the American Pharmacists Association on the Pharmacy Technician Certification Board's Certification Council. The authors are not aware of any actual or perceived conflicts of interest.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Stafford L, Peterson GM, Bereznicki LR, et al. Clinical outcomes of a collaborative, home-based postdischarge warfarin management service. *Ann Pharmacother*. 2011;45:325-334.
2. Stafford L, Peterson GM, Bereznicki LR, Jackson SL. A role for pharmacists in community-based post-discharge warfarin management: protocol for the "the role of the community pharmacy in post hospital management of patients initiated on warfarin" study. *BMC Health Serv Res*. 2011;11:16.
3. Gubbins PO, Klepser ME, Dering-Anderson AM, et al. Point-of-care testing for infectious diseases: opportunities, barriers, and considerations in community pharmacy. *J Am Pharm Assoc (2003)*. 2014;54:163-171.

4. Powers MF, Bright DR. Pharmacy technicians and medication therapy management. *J Pharm Technol*. 2008;24:336-339.
5. Geerts AF, De Koning FH, De Vooght KM, Egberts AC, De Smet PA, van Solinge WW. Feasibility of point-of-care creatinine testing in community pharmacy to monitor drug therapy in ambulatory elderly patients. *J Clin Pharm Ther*. 2013;38:416-422.
6. Ferreri SP, Greco AJ, Michaels NM, et al. Implementation of a pharmacogenomics services in a community pharmacy. *J Am Pharm Assoc* (2003). 2014;54:172-180.
7. Council on Credentialing in Pharmacy; Albanese NP, Rouse MJ. Scope of contemporary pharmacy practice: roles, responsibilities, and functions of pharmacists and pharmacy technicians. *J Am Pharm Assoc* (2003). 2010;50:e35-e69.
8. Johannigman MJ, Leifheit M, Bellman N, Pierce T, Marriott A, Bishop C. Medication therapy management and condition care services in a community-based employer setting. *Am J Health Syst Pharm*. 2010;67:1362-1367.
9. Bright DR, Lengel AJ, Powers MF. Pharmacists' perceptions of barriers to implementing medication therapy management and the role of pharmacy technicians in overcoming the barriers. *J Pharm Technol*. 2009;25:361-367.
10. Rodis JL, Thomas RA. Stepwise approach to developing point-of-care testing services in the community/ambulatory pharmacy setting. *J Am Pharm Assoc* (2003). 2006;46:594-604.
11. American Diabetes Association. Standards of medical care in diabetes—2014. *Diabetes Care*. 2014;37:S14-S80.
12. Becton Dickinson and Company. Alternate blood glucose testing on arm, palm, and thigh. <https://www.bd.com/us/diabetes/blood-glucose-monitoring/how-to-test/alternate-site/>. Accessed January 6, 2015.
13. OneTouch. LifeScan, Inc. <http://www.onetouch.com/home>. August 26, 2014.
14. Freestyle InsuLinX. Abbott. https://www.myfreestyle.com/products/freeStyle-insuLinx-blood-glucose-monitoring-system.html?icid=in_footer-product-banner_freestyle-insu-linx-test-strips_freestyle-insulinx. Accessed January 6, 2015.
15. iBG Star. Sanofi-Aventis US LLC. <http://www.ibgstar.us/default.aspx>. Accessed August 26, 2014.
16. DCA Vantage operator guide. Siemens Healthcare Diagnostics Inc. <http://wilburnmedicalusa.com/dcaVantage.pdf>. Accessed December 10, 2014.
17. Afinion HbA1C. Afinion Point of Care Center. <http://www.cliawaived.com/web/items/pdf/ABBT-06L13-10insert.pdf>. Accessed January 6, 2015.
18. Cholestech LDX System. Alere. <http://www.alere.com/us/en/product-details/cholesteck-ldx-system.html>. Accessed January 6, 2015.
19. CardioChek user guide. PTS Diagnostics. <http://www.ptsdiagnostics.com/cardiochek.html>. Accessed December 12, 2014.
20. CoaguChek XS System user manual. Roche Diagnostics. http://www.cliawaived.com/web/items/pdf/Coaguchek_XS_Home_test_system~1499file1.pdf. Accessed December 15, 2014.
21. CoaguChek XS Plus System user manual. Roche Diagnostics. <http://coaguchek-usa.com/documents/coaguchek-xs-plus-user-manual.pdf>. Accessed December 15, 2014.
22. CoaguChek XS Pro System user manual. Roche Diagnostics. <http://coaguchek-usa.com/documents/coaguchek-xs-pro-operators-manual.pdf>. Accessed December 15, 2014.
23. Coag-Sense professional user's manual. CoaguSense, Inc. <http://www.quickmedical.com/downloads/coag-sense-professional-test-users-manual.pdf>. Accessed January 3, 2015.
24. Howerton D, Anderson N, Bosse D, Granade S, Westbrook G. Good laboratory practices for waived testing sites. *MMWR Recomm Rep*. 2005;54(RR13):1-25.
25. Centers for Medicare and Medicaid Services. Clinical Laboratory Improvements Amendments (CLIA). <http://www.cdc.gov/clia>. Accessed August 21, 2014.
26. Centers for Medicare and Medicaid Services. How to obtain a CLIA certificate of waiver. <http://www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/downloads/HowObtainCertificateofWaiver.pdf>. Accessed August 21, 2014.
27. Centers for Disease Control and Prevention. To test or not to test? Considerations for waived testing. <http://www.cdc.gov/clia/Resources/WaivedTests/pdf/WavedTestingBookletWeb.pdf>. Accessed August 21, 2014.
28. US Food and Drug Administration. CLIA—Clinical Laboratory Improvement Amendments—currently waived analytes. <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfclia/analyteswaived.cfm>. Accessed January 6, 2015.
29. Taylor EF, Lake T, Nysenbaum J, et al. Coordinating care in the medical neighborhood: critical components and available mechanisms (AHRQ Publication No. 11-0064). <http://pcmh.ahrq.gov/sites/default/files/attachments/Coordinating%20Care%20in%20the%20Medical%20Neighborhood.pdf>. Accessed March 11, 2015.
30. Palombi LC, Bastianelli K, Stratton T. Point-of-care screenings at the University of Minnesota: mechanism for civic engagement. *J Am Pharm Assoc* (2003). 2014;54:56-62.