The Minnesota Pharmacy Practice-Based Research Network

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A Practice-Based Research Network (PBRN) is “a group of ambulatory practices devoted principally to the primary care of patients, affiliated with each other (and often with an academic or professional organization) in order to investigate questions related to community based practice” [1]. PBRNs first were formed in primary care practices in the late 1970s [2-3] and involved community-based clinicians and their staffs in activities designed to help understand and improve primary care [1]. The goal was to link relevant practice questions with rigorous research methods in community settings to provide information that was reliable, valid, and transferable into everyday practice.

Thought leaders within pharmacy have begun developing and implementing Pharmacy Practice-Based Research Networks [4]. The advantages of such networks to patient care and to society are rooted in the use of medications by almost all members of society during their lifetime and the accessibility that pharmacies provide to the public. The use of medications is likely to be the only treatment modality with which people interact on a daily basis. Over 500 million times a day in the United States, individuals make the decision to-take or not-to-take a prescription medication [5]. In addition there are approximately 6 million pharmacy visits per day [5]. Arguably, these are the most frequently occurring health care events, far outpacing such things as the number of physician office visits (2.6 million per day) [6], hospital inpatient procedures (123,287 per day) [7], and hospital discharges (108,041 per day) [7]. Eighty percent of the way chronic diseases are prevented and managed is with medications [8]. In any given week, 81% of U.S. adults take at least one medication, and nearly one-third take five or more different medications [9-10]. Over a lifetime, it is estimated that a typical person will take 14,000 pills [11]. When one considers that a 60-year span of adulthood is about 22,000 days, the frequency with which individuals interact with medications is astounding.

A person’s regular interaction with medications is not only a frequently and consistently occurring health care event, it also interfaces with almost all other aspects of his or her health care. For example, according to the World Health Organization, adherence to medication therapies is the primary determinant of treatment success and the consequences of poor adherence are poor health outcomes and increased health-care costs [12]. When transitions in care, such as hospitalization, are experienced by
individuals, they become especially vulnerable for medical errors as a result of incomplete or inaccurate communication about medication therapies. After hospital and intensive care unit discharges, individuals are at high risk for unintentional discontinuation of medications with proven efficacy for treating chronic diseases [13]. Avoidable hospital readmissions are directly related to medication-related events about one-third of the time [14].

Developing capacity for research in networks of community pharmacies could help fill gaps in our understanding of the medication use process by focusing upon (1) questions encountered by pharmacist practitioners in their practices, (2) issues that are relevant to members of diverse communities served by these practices, and (3) research that can be shared quickly with pharmacy practice and the broader healthcare community. The advantages of such an approach are clear. In the U.S. there are more than 70,000 pharmacies in all types of health care facilities including more than 56,000 community pharmacies. The geographic locations of pharmacies are based upon community members’ preferences for convenience and access, making them a logical site though which care can be studied and enhanced [15]. Pharmacists are central to the medication use process and are the most frequently encountered health professionals for many patients. In addition to access and convenience, studies in community pharmacy settings afford the opportunity to observe self-care behaviors that overlay prescribed therapies including over-the-counter drugs and nutritional supplements [16]. For patients under the care of multiple prescribers, the pharmacy serves as an “ideal place for studying and improving the continuity and coordination of care across settings” [16]. Since many patients visit pharmacies at frequent and regular intervals it is an ideal place to examine the quality, safety, efficiency, and effectiveness of many prescribed treatments for chronic care [16].

Such access to patients at the point of procuring most of the medications utilized in the U.S. presents a unique opportunity for pharmacists and pharmacies to help contribute to an understanding of the medication use process. Pharmacy-Based PBRNs can focus on collecting information in real-world settings (pharmacies) to help address societal, community, or professional questions that relate to medication use. Such a focus would expand upon existing work and begin to collect information for the
purpose of addressing societal and community questions related to the medication use process. In this domain, pharmacy PBRNs can serve as natural laboratories in the field setting to address a variety of questions.

The Minnesota Pharmacy Practice-Based Research Network (MPPBRN)

The Minnesota Pharmacy Practice-Based Research Network (MPPBRN) was launched on February 26, 2008. Its stated purpose is to collect information using a network of pharmacies for the purpose of addressing societal and community questions related to the medication use process. Such a network serves as a natural laboratory and represents a novel way to address societal needs related to health and wellness. The MPPBRN is a collaboration among the Minnesota Pharmacists Association, University of Minnesota, and Pharmacist Practitioners and has been designed to serve as a meeting point for sharing and generating new ideas that are relevant to the interface among the practice of pharmacy, health care, health systems, health technologies, communities, and society overall. Guiding principles for this PBRN can be found in Appendix A.

For sharing information with external partners, the MPPBRN was registered with the AHRQ PBRN Registry (http://pbrn.ahrq.gov/portal/server.pt). A copy of our PBRN certificate is in Appendix B. Information about our PBRN can be found at:


The MPPBRN membership roster is kept on a spreadsheet that remains confidential at the request of some of the MPPBRN members. Some members wish to keep their identities confidential so that their contact for potential participation in projects is only through the MPPBRN directors and not from other sources. A summary of the current capabilities of the Minnesota Pharmacy PBRN can be found in Appendix C. As of February 2012, the Minnesota Pharmacy PBRN consisted of 366 geographically dispersed pharmacies and 23 principal investigators from the University of Minnesota (see
Appendix D). A summary of projects that have utilized the Minnesota Pharmacy PBRN can be found in Appendix E.

Projects conducted so far have utilized PBRN pharmacies for (1) patient access, (2) data access, (3) pharmacist participation, and (4) practice change demonstrations. In addition to reports and doctoral dissertations that have resulted from the PBRN projects, dissemination of findings has been accomplished through peer-reviewed presentations and publications. During 2011, our PBRN was contacted by several states in which PBRNs were being formed. As more Pharmacy-Based PBRNs are launched throughout the United States, we will have new opportunities for collaboration. We are entering our fifth year as a PBRN and we believe that areas for growth include things such as:

- involvement with other disciplines, community members, other stakeholders
- collaboration with PBRNs that are forming in other states
- continued engagement of communities and professional organizations
- management of multiple-site projects
- translating results into practice
- strategic planning as needs / environments change
- instrument testing and development
- data collection, storage, management and analysis
- communication over distances and over time

Oversight for the MPPBRN is accomplished through a “Guidance and Oversight Board.” This five-member board meets quarterly and consists of the PBRN coordinators (Jon Schommer, Julie Johnson), one of the principal investigators (Ron Hadsall), a representative from one of the PBRN pharmacies (currently, this position is open), and a representative from the public domain (currently filled by a member of MPhA staff). This board typically meets in person, but also has met via distance technology (telephone, interactive television, etc.). In-person meetings have taken place at MPhA offices, the University of Minnesota, and at professional conferences. If you are interested in serving on the Guidance and Oversight Board, please let Jon Schommer (schom010@umn.edu) or Julie Johnson (Julie@mpha.org) know.
References


Five Useful Web Sites for More Information about Practice-Based Research Networks


3. [http://www.aphafoundation.org/programs/Practice%5Fbased%5FResearch/](http://www.aphafoundation.org/programs/Practice%5Fbased%5FResearch/) - American Pharmacists Association Foundation web site containing examples of projects that utilized a practice-based research approach.

4. [http://www.jabfm.org/](http://www.jabfm.org/) - Journal of the American Board of Family Medicine web site where the July/August 2008 special issue of JABFM can be accessed. This issue contains examples of reports based upon primary care PBRN work.

5. [http://www.annfammed.org/content/vol3/suppl_1/index.shtml](http://www.annfammed.org/content/vol3/suppl_1/index.shtml) - A supplement to the Annals of Family Medicine in July 2005 was devoted to Practice-Based Research Networks.
Appendix A
Minnesota Pharmacy Practice-Based Research Network: Guiding Principles

Role of University of Minnesota

- Provide infrastructure for PBRN such as Institutional Review Board, Responsible Conduct of Research, Sponsored Projects Administration, Sponsored Financial Reporting, etc.
- Maintenance of PBRN “Capacity Portfolio”
- Proposal preparation and submission
- Grant management
- Reporting

Role of Minnesota Pharmacists Association

- Monitor professional and political trends
- Community engagement
- Professional engagement
- Interprofessional / Interdisciplinary relations
- State-wide communication and coordination
- Networking
- Continuous quality improvement

Operating Principles

- The PBRN “Capacity Portfolio” would be an internal document for use by U of M and MPhA and may be submitted to funding agencies as part of our proposals
- Pharmacies would be contacted on an annual basis to update their information in the PBRN Capacity Portfolio
- Principal Investigators are responsible for following policies and procedures as set forth by SPA, IRB, RCR, HIPAA, etc.
- The PBRN will be coordinated as a joint effort by U of M and MPhA
- Pharmacies would be paid through subcontracts or “contracts for service” for work that is reimbursable in grants
- Subcontracts and “contracts for service” would be part of individual grant proposals and amounts would be determined for each proposal at the time of submission to funding agencies.
- Grant proposals would include U of M overhead according to University guidelines
- Subcontracts with MPhA would be “not less than 10% of the direct costs” for the given proposal

Principal Investigators Behavior

- align goals with practitioners and communities
- listen
- develop collaboration and trust
- communicate
- nurture relationships
- engage patients and communities in practice-based research

Considerations for Interacting with Patients

- Avoid Information Overload
- Patient Security, keep the feeling of being “safe”
- Allow Patients to “Drive the Bus” (flexible research protocol)
- Opportunity for Continuation after the Study is Completed
- The Unexpected is OK
- Make Participation Easy
- “Be the Patient”
- It’s Not about Me
Appendix B
2012 Registration with the AHRQ PBRN Resource Center

AHRQ PBRN RESOURCE NETWORK

This certificate is awarded to

MINNESOTA PHARMACY PRACTICE-BASED RESEARCH NETWORK

This acknowledges the 2012 registration with the AHRQ PBRN Resource Center as an Affiliate primary care Practice-Based Research Network.

Kevin Peterson, Co-Director
Steve Durako, Co-Director
Appendix C

Current Capabilities of the Minnesota Pharmacy PBRN

University of Minnesota
The University of Minnesota provides rich resources for planning, implementation, and oversight of practice-based research projects. Our PBRN is fully engaged and coordinated with these University of Minnesota resources and has met all training and preparation requirements for engaging in research.

- **Investigational Review Board (IRB)** The IRB reviews research projects which involve human subjects to ensure that two broad standards are upheld: first, that subjects are not placed at undue risk; second, that they give uncoerced, informed consent to their participation. With representation from a wide range of scientific disciplines and from outside the academic community, the IRB gives rapid but individualized attention to the numerous research projects at the University. [www.irb.umn.edu](http://www.irb.umn.edu)

- **Sponsored Projects Administration (SPA)** SPA is the University of Minnesota system-wide office authorized to submit research proposals and receive awards from external sources on behalf of the Board of Regents of the University of Minnesota. SPA is also the fiduciary for the University's grant-related matters. [www.ospa.umn.edu](http://www.ospa.umn.edu)

- **Sponsored Financial Reporting (SFR)** Sponsored Financial Reporting is responsible for managing the external financial reporting and invoicing requirements of sponsored University research projects [www.sfr.umn.edu](http://www.sfr.umn.edu)

- **Responsible Conduct of Research (RCR)** (e.g. responsible conduct of research training set up for each principle investigator) [http://egms.umn.edu/rcr/](http://egms.umn.edu/rcr/)

We have met with each university office for developing, submitting, and implementing research proposals and will follow established University of Minnesota guidelines for our PBRN practices.

Minnesota Pharmacists Association (MPhA)

The Mission of MPhA is “Serving Minnesota Pharmacists to advance patient care.” MPhA is a state professional association, whose membership is made up of pharmacists, pharmacy students, pharmacy technicians, and those with a business interest in pharmacy. Besides offering a one-stop information site for its members, consumers are also welcome to use their pharmacy locator and browse for information specific to their needs. For the Minnesota Pharmacy PBRN, the Minnesota Pharmacists Association serves as a valuable resource for linking researchers from the University of Minnesota, Pharmacy Practitioners, and Communities throughout the state of Minnesota. MPhA is taking a leadership role for:

- Monitoring professional and political trends
- Community engagement
- Professional engagement
- Interprofessional / Interdisciplinary relations
- State-wide communication and coordination
- Networking
- Continuous quality improvement

**Practice Sites in the Minnesota Pharmacy PBRN**
As of December 2012, there were 366 pharmacy practice locations for the Minnesota Pharmacy PBRN that included: (1) community-based pharmacies, (2) hospital-based pharmacies, (3) community-based clinics, and (4) one investigational drug service (not available to the general public). All but six of
the PBRN pharmacies dispense medications to the public. The investigational drug service location provides expertise in specialty medicine preparation, project design for clinical research, and implementation of clinical research.

The Minnesota Pharmacy PBRN pharmacy practice locations are geographically dispersed throughout the state of Minnesota (with one being located in the Chicago area). The geographic distribution of the PBRN locations is consistent with the distribution of pharmacy practice locations in Minnesota overall. Maps of PBRN locations and all pharmacy locations in the state are available upon request.

Practice sites have indicated their level of interest in collaborating on projects for which there is a diverse array of activities such as:

- data retrieval
- pharmacy surveys
- pharmacist surveys
- collection of patient reported outcomes
- location for research assistant conducted observations and/or interviews
- provision of various services as required by studies (e.g. cholesterol check, etc.)
- patient screening
- patient education
- patient referral
- patient continuity of care
- patient follow-up
- product preparation
- drug regimen review
- community engagement
## Appendix D  
### Principal Investigators

<table>
<thead>
<tr>
<th>Investigator Name</th>
<th>Email Address</th>
<th>Interest Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrence Adam</td>
<td><a href="mailto:Adamx004@umn.edu">Adamx004@umn.edu</a></td>
<td>Medical informatics, database development and applications</td>
</tr>
<tr>
<td>Rodney Carter</td>
<td><a href="mailto:Carte068@umn.edu">Carte068@umn.edu</a></td>
<td>Impact of experiential education and other interactions with colleges of pharmacy on practice.</td>
</tr>
<tr>
<td>Patrick Gleason</td>
<td><a href="mailto:pgleason@primetherapeutics.com">pgleason@primetherapeutics.com</a></td>
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<tr>
<td>Cynthia Gross</td>
<td><a href="mailto:Gross002@umn.edu">Gross002@umn.edu</a></td>
<td>Complementary treatment to improve diabetes self-management</td>
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<tr>
<td>Ronald Hadsall</td>
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<td>Pharmacy and Pharmaceutical Policy</td>
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<tr>
<td>Brian Isetts</td>
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<td>Clinical and economic outcomes of medication therapy management</td>
</tr>
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<td>Thomas Lackner</td>
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<td>Kevin Peterson</td>
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<td>Delivery of pharmacy services to rural and urban underserved populations</td>
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<td>Stuart Speedie</td>
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<td>e-prescribing implications to pharmacists and other health care providers</td>
</tr>
<tr>
<td>Wendy St. Peter</td>
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<td>Care models and pharmacotherapy of patients with chronic kidney disease (including ESRD)</td>
</tr>
<tr>
<td>Timothy Stratton</td>
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</tr>
<tr>
<td>Donald Uden</td>
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<td>Pulmonary disease; interprofessional practice and education</td>
</tr>
<tr>
<td>Sarah Westberg</td>
<td><a href="mailto:swestber@umn.edu">swestber@umn.edu</a></td>
<td>Impact of medication therapy management on patient outcomes.</td>
</tr>
<tr>
<td>Marcia Worley</td>
<td><a href="mailto:m-worley@onu.edu">m-worley@onu.edu</a></td>
<td>Pharmacist – patient professional relationships and behavioral aspects of medication use.</td>
</tr>
<tr>
<td>Kim Zemke</td>
<td><a href="mailto:Zemke907@umn.edu">Zemke907@umn.edu</a></td>
<td>Clinical systems development and redesign.</td>
</tr>
<tr>
<td>Therese Zink</td>
<td><a href="mailto:Zink0003@umn.edu">Zink0003@umn.edu</a></td>
<td>Family Medicine / Community Health; Medication reconciliation in rural communities</td>
</tr>
</tbody>
</table>
# Appendix E

## Projects that have utilized the Minnesota Pharmacy PBRN

<table>
<thead>
<tr>
<th>Project title</th>
<th>Investigator to contact for more information</th>
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<tbody>
<tr>
<td><strong>2008</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1. Assessing Organizational Responses to AHRQ’s Health Literacy Pharmacy Tools | Sarah Shoemaker  
Sarah_shoemaker@abtassoc.com |
| 2. Collaborative Rural Hospice Care for Improving Medication Therapy Management | Jon Schommer  
schom010@umn.edu |
| **2009**      |                                             |
| 3. Best Buy Drug Evaluation Project | Jon Schommer  
schom010@umn.edu |
| 4. Social Networks in Medication Information Seeking | Marcia Worley  
worl0016@d.umn.edu |
| 5 - 6. Novel Delivery Methods for Medication Therapy Management | Mark Schneiderhan  
meschnei@d.umn.edu |
| 7. Evaluation of AWARxE Medication Take-Back Project | Jon Schommer  
schom010@umn.edu |
| 8. Improving Provision of Medication Therapy Management in Ambulatory Care Settings | Jon Schommer  
schom010@umn.edu |
Peter223@umn.edu |
| 10. Osteoporosis Project | Rick Cline  
cline011@umn.edu |
| **2010**      |                                             |
| 11. Chronic Renal Disease Project | Wendy St. Peter  
stpet002@umn.edu |
| 12. Interprofessional Collaboration Project | Tom Lackner  
Thomas.e.lackner-1@umn.edu |
| 13. Complementary Treatment to Improve Diabetes Self-Management | Cindy Gross  
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| 14. Establishing Pharmacist Practice-Based Research Networks | Jon Schommer  
schom010@umn.edu |
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Author(s)</th>
</tr>
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<tr>
<td>15. Project to Develop a Voice-Activated Pharmacy/Patient Consultation System to Support Medication Therapy Management Delivery and Billing Services</td>
<td>Jon Schommer <a href="mailto:Schom010@umn.edu">Schom010@umn.edu</a></td>
</tr>
<tr>
<td>16. “Future of Medication Therapy Management” Roundtable</td>
<td>Jon Schommer <a href="mailto:Schom010@umn.edu">Schom010@umn.edu</a></td>
</tr>
<tr>
<td>17. Evaluation of a Consumer –Generated MTM Marketing Plan</td>
<td>Brian Isetts <a href="mailto:Isett001@umn.edu">Isett001@umn.edu</a></td>
</tr>
<tr>
<td>18. Addressing Primary Medication Non-Adherence Using A Personalized Medication Use Enhancement Technology</td>
<td>Richard Cline <a href="mailto:Cline011@umn.edu">Cline011@umn.edu</a></td>
</tr>
<tr>
<td>19. Study of the Workforce Engaged in Comparative Effectiveness Research for Pharmaceuticals</td>
<td>Jon Schommer <a href="mailto:Schom010@umn.edu">Schom010@umn.edu</a></td>
</tr>
<tr>
<td>20. Medication Reconciliation</td>
<td>Ann Philbrick <a href="mailto:philb020@umn.edu">philb020@umn.edu</a></td>
</tr>
<tr>
<td>21. Work System Capacity for Medication Therapy Management</td>
<td>Jon Schommer <a href="mailto:Schom010@umn.edu">Schom010@umn.edu</a></td>
</tr>
<tr>
<td>22. Increasing the rate of aspirin use for cardiac prevention</td>
<td>Kevin Peterson <a href="mailto:Peter223@umn.edu">Peter223@umn.edu</a></td>
</tr>
<tr>
<td>23. Brand vs. Generic Medications for Treatment of Epilepsy</td>
<td>Melody Ryan (Kentucky) <a href="mailto:maryan1@email.uky.edu">maryan1@email.uky.edu</a></td>
</tr>
<tr>
<td>24. Community-Engagement Key-Function Committee</td>
<td>Kevin Peterson <a href="mailto:Peter223@umn.edu">Peter223@umn.edu</a></td>
</tr>
<tr>
<td>25. Unbundling the charges for medication dispensing and medication therapy management services</td>
<td>Paul Iverson <a href="mailto:Paul@iversoncornerdrug.com">Paul@iversoncornerdrug.com</a></td>
</tr>
<tr>
<td>26. Demonstration Project for Pharmacy Outcomes Enhancement Technology</td>
<td>Jon Schommer <a href="mailto:Schom010@umn.edu">Schom010@umn.edu</a></td>
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**2011**

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<tr>
<th>Project Description</th>
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<tr>
<td>27. Isoniazid Adherence</td>
<td>Chrystian Pereira <a href="mailto:pereira@umn.edu">pereira@umn.edu</a></td>
</tr>
<tr>
<td>28. Leading Practice Change</td>
<td>Jon Schommer <a href="mailto:schom010@umn.edu">schom010@umn.edu</a></td>
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<tr>
<td></td>
<td>Kevin Peterson <a href="mailto:peter223@umn.edu">peter223@umn.edu</a></td>
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<tr>
<td>29. Community Engagement</td>
<td>Jon Schommer <a href="mailto:schom010@umn.edu">schom010@umn.edu</a></td>
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<td></td>
<td>Kevin Peterson</td>
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<td>Pharmacy Workflow Analysis</td>
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<td>Medication Adherence Demonstration Project</td>
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<td>33.</td>
<td>Patient Engagement in Medication Taking for Patients with Type-2 Diabetes</td>
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<td>34.</td>
<td>Relevant Expectations and Medication Adherence for Treatment of Diabetes</td>
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<td>35.</td>
<td>Tailored Medication Adherence Interventions to Improve Patient Outcomes</td>
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<td>Pharmacists as members of Primary Care Teams</td>
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