

# The Role of Health Systems in Reducing Tobacco Dependence

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## ABSTRACT

**OBJECTIVES:** Health systems play an important role in addressing tobacco use. Research indicates that implementing systems changes in clinical settings may lead to greater rates of tobacco treatment delivery and reductions in tobacco use prevalence compared with clinics and health systems that do not implement such changes. Few studies have described facilitators and barriers to implementing these changes.

**STUDY DESIGN:** A process evaluation was conducted of 5 Minnesota health systems that implemented multiple systems changes to make tobacco treatment delivery a standard of care. Three large integrated health systems (1 in the Twin Cities metropolitan area, 1 in northern Minnesota, and 1 in central Minnesota), a federally recognized Minnesota Chippewa Tribe, and a safety net dental practice were evaluated.

**METHODS:** An external evaluator conducted 3 waves of key informant interviews with each system. Purposive sampling was used to select key informants from each health system. A total of 49 interviews among 30 staff were conducted. Project documents were also reviewed. Evaluators used both deductive and inductive approaches to identify cross-cutting themes.

**RESULTS:** Several facilitators were identified, including using a team-based approach to engage staff, implementing new protocols and training staff, and utilizing tools such as electronic health records and data to conduct quality improvement initiatives. Barriers included delays in electronic health record changes and keeping tobacco treatment prioritized in the organization.

**CONCLUSIONS:** Health systems change can provide a renewed sense of enthusiasm and ownership of tobacco treatment among providers and staff and can be an effective way to help prioritize addressing tobacco use.

*The American Journal of Accountable Care. 2019;7(2):4-11*

Tobacco use screening and brief intervention is 1 of the top 3 preventive services in terms of cost savings and potential population health improvement.<sup>1,2</sup> Health systems play an important role in addressing tobacco use. Seventy-five percent of current smokers report visiting a healthcare provider in the past year.<sup>3</sup> The majority of smokers want their healthcare provider to address their smoking,<sup>4,5</sup> and satisfaction with care is highest among smokers who receive cessation assistance or follow-up.<sup>4,6</sup>

The US Public Health Service (PHS) Clinical Practice Guideline, *Treating Tobacco Use and Dependence*, recommends implementing the 5 As (Ask, Advise, Assess, Assist, and Arrange) to systematically address tobacco use.<sup>7,8</sup> Implementing the 5 As, including brief interventions by providers, is associated with greater tobacco cessation efforts among patients compared with no intervention<sup>9</sup>; research also demonstrates that brief advice from a physician increases successful quitting.<sup>10</sup> Nationally, healthcare providers consistently *assess* for tobacco use (90%) and frequently *advise* patients to quit (71%), but far fewer *assist* patients to quit (49%).<sup>4</sup> A similar gap is seen in Minnesota.<sup>11</sup>

The PHS Clinical Practice Guideline and the CDC also recommend that clinics and health systems implement health systems changes to improve tobacco treatment delivery (eg, establishing a process to identify tobacco users, educating staff on tobacco treatment, providing resources and feedback to promote interventions).<sup>7,12</sup> Evidence suggests that health systems change can improve care delivery processes compared with clinical settings where such changes were not implemented.<sup>7,13</sup> Although the evidence is mixed regarding whether systems change improves

**Table 1. Health System Characteristics**

Type of Health System	Number of Minnesota Counties Served <sup>a</sup>	Number of Providers	Number of Patients Served Annually
Safety net dental system with urban and rural locations	>30	100-250	20,000-40,000
Large, integrated, rural health system in northern Minnesota	20-30	>1000	>900,000
Large, integrated health system in central Minnesota	10-20	>1000	300,000-500,000
Large, integrated, urban health system in the Twin Cities metropolitan area	1-10	250-500	>900,000
A constituent of the federally recognized Minnesota Chippewa Tribe	1-10	<100	<10,000

<sup>a</sup>This range reflects the number of counties served by the health system throughout Minnesota.

cessation outcomes,<sup>13</sup> some studies have shown that systems change in clinic settings can reduce the prevalence of tobacco use.<sup>8,9</sup> However, few studies have examined factors that influence systems change implementation.<sup>14</sup>

ClearWay Minnesota, an independent nonprofit organization, released a competitive request for proposals to fund Minnesota healthcare systems for the implementation of health systems changes to more successfully address tobacco use. Applicants applied for up to \$200,000 to fund a 2-year project; they were instructed to propose evidence-based strategies that aligned with their organization’s goals to better assess and address tobacco use. ClearWay Minnesota identified 3 areas of interest for applicants to consider: incorporating best practices for systems change, such as those outlined in the Clinical Practice Guideline<sup>7</sup>; optimizing their electronic health record (EHR); and using quality improvement processes. An expert review panel evaluated proposals and made funding recommendations. Funding decisions were made by ClearWay Minnesota’s Board of Directors. Three integrated health systems (1 in the Twin Cities metropolitan area, 1 in northern Minnesota, and 1 in central Minnesota), a federally recognized Minnesota Chippewa Tribe, and a safety net dental practice were funded (see **Table 1** for health system characteristics).

We conducted a process evaluation to better understand facilitators and barriers to systems change implementation experienced by these diverse health systems. The insights reported in this paper can inform other systems change efforts.

## METHODS

### Study Design

Professional Data Analysts, an independent external evaluation firm, conducted the process evaluation. A qualitative approach, informed by Yin’s case study methodology<sup>15</sup> and Patton’s qualitative design principles,<sup>16</sup> was used to capture the complexity of the systems change process, as well as to gain insight on the facilitators, barriers, lessons learned, and potential sustainability of these changes. Intervention approaches differed across sites; examples included training staff and providers on delivering the 5 As, optimizing EHRs for clinical decision support and documentation, and creating standard

workflows and procedures for identifying and treating tobacco users. All 5 health systems conducted their systems change activities over a 2-year period; 3 sites conducted activities from 2014 to 2016 and 2 sites from 2015 to 2017. A contracted technical assistance provider supported grantees on an as-needed basis.

**Document review.** ClearWay Minnesota provided the evaluators with key documents for each health system (eg, grant application, progress reports, meeting notes). Throughout the grant period and before each round of interviews, 2 evaluators independently reviewed all documents to inform interview protocol development.

**Key informant interviews.** The evaluators conducted 3 waves of semistructured interviews with key informants at each health system at the beginning, midpoint, and end of each 2-year grant period. Interview protocols were based on document review, previous systems

**Table 2. Example Interview Questions**

Category	Questions
Facilitators of change	<ul style="list-style-type: none"> <li>Whose support or buy-in has been critical to implementing the new workflow and electronic health record elements?</li> <li>What were some key facilitators of the Certified Tobacco Treatment Specialist expansion across the system?</li> </ul>
Barriers to change	<ul style="list-style-type: none"> <li>What challenges, if any, have staff encountered using the different electronic health record referral options?</li> <li>What challenges have been encountered in organizing and conducting trainings?</li> </ul>
Lessons learned	<ul style="list-style-type: none"> <li>What have you learned from the quality improvement process?</li> <li>Are there lessons learned that you would share with other health systems looking to implement tobacco-related systems changes?</li> </ul>
Sustainability	<ul style="list-style-type: none"> <li>Thinking about this work a year from now, which aspects do you feel might continue and which might not?</li> <li>How do you plan to keep tobacco cessation a priority throughout the health system?</li> </ul>

change studies,<sup>4,8,9,14</sup> tobacco control best-practice guidelines,<sup>12</sup> and input from ClearWay Minnesota staff. Although each health system's interview protocol was tailored to its project, all interviews were used to gather information about facilitators, barriers, lessons learned, and potential sustainability. **Table 2** lists example interview questions.

### Participants

Interviewees were selected through purposive sampling.<sup>16</sup> ClearWay Minnesota staff and health system staff identified key informants within each system who were knowledgeable about the project, and evaluators invited them to participate by email. No participants declined an interview. **Table 3** describes key informant characteristics.

Evaluators interviewed a minimum of 2 key informants from each health system during each interview wave. Interviews lasted 30 to 90 minutes; almost all were conducted face to face by 2 evaluators (1 primary, 1 secondary), but 2 interviews were conducted by phone. The primary evaluator was involved in all interviews; 1 of 2 other evaluators served as a secondary interviewer. A total of 49 interviews were conducted with 30 individuals across waves and across the 5 health systems (Table 3). All interviewees consented to have their interviews recorded. The evaluators created a detailed summary of each interview and sent it to the interviewees to review for completeness and accuracy. Subsequent corrections or additions from interviewees were incorporated into final summaries.

### Data Analysis

After each interview wave, evaluators conducted content analysis of each interview summary, organizing the data into 4 a priori categories based on key lines of interview questioning: facilitators, barriers, lessons learned, and potential sustainability. After the last interview wave, evaluators used the organized summaries from all 5 sites to

conduct a cross-site analysis to identify common themes within each of the 4 categories. Evaluators used both deductive and inductive approaches to identify themes across sites.<sup>16,17</sup> The health systems change literature<sup>4,8,9,14</sup> provided initial guidance for themes that might be identified during analysis. The primary evaluator identified common themes from the data, comparing data across the 5 health systems. These themes were then reviewed by the second evaluator. The 2 evaluators discussed any new themes or differences in interpretation until they reached consensus. Quotations or excerpts from interview notes and recordings were deidentified to protect the confidentiality of the individual and the health system.

The Minnesota Department of Health Institutional Review Board determined this study to be exempt from further review.

## RESULTS

Facilitators, barriers, and lessons learned, as well as opportunities and challenges to sustaining systems change, are reported here.

### Facilitators

Six facilitators of change were identified. Because each health system is unique, strategies varied based on the health system's goals. Additional strategies are listed in **Table 4**.

Each grantee recognized the importance of building system-level support to elevate tobacco use as a priority and to leverage internal resources. Engaging organizational leaders by including them on project teams, as well as identifying clinic champions, helped to send a powerful signal across the organization of the importance of this work and to increase staff buy-in and enthusiasm for systems change.

*“Having that buy-in from a leadership level all the way up to the CEO [chief executive officer] of the organization to say, ‘This is a priority, and we’re investing in it.’” – Project manager*

**Table 3. Key Informant Characteristics**

Type of Health System	Number of Unique Interviewees	Number of Interviews Across 3 Waves	Interviewee Roles
Safety net dental system with urban and rural locations	7	10	Health system leadership, project staff, information technology staff, clinic champions
Large, integrated, rural health system in northern Minnesota	4	9	Project staff, quality improvement staff, primary care staff
Large, integrated health system in central Minnesota	7	11	Physician champion, quality improvement staff, care coordinators, tobacco treatment staff, project staff
Large, integrated, urban health system in the Twin Cities metropolitan area	5	8	Project staff, physician champion, quality improvement staff, information technology staff
A constituent of the federally recognized Minnesota Chippewa Tribe	7	11	Project staff, clinic staff, clinic champion, health and human services staff and leadership
<b>Total</b>	<b>30</b>	<b>49</b>	

**Table 4. Example Strategies to Facilitate Change**

Facilitator of Change	Example Strategies
Building system-level support	<ul style="list-style-type: none"> <li>• Worked with the ambulatory care quality committee to approve a minimum standard of asking every patient about their tobacco use at least annually across all ambulatory care clinics</li> <li>• Pilot tested new workflows to demonstrate success to and receive buy-in from system leadership to continue implementation</li> </ul>
Taking a team approach	<ul style="list-style-type: none"> <li>• Brought together staff with varying roles and from multiple departments to form cross-disciplinary teams, such as a Data and Evaluation Workgroup to develop documentation and tools and ensure that key data from the EHR could be extracted</li> <li>• Conducted needs assessments with clinic staff to identify gaps and the tools/resources needed in assessing and addressing tobacco use with patients</li> </ul>
Capitalizing on internal and external priorities	<ul style="list-style-type: none"> <li>• Integrated tobacco into new rooming workflows for medical assistants that were already being piloted within primary care clinics</li> <li>• Identified cessation intervention opportunities by tracking the number of patients with diabetes and/or vascular issues not meeting quality measures due to their tobacco use</li> </ul>
Implementing new protocols and training staff	<ul style="list-style-type: none"> <li>• Redefined primary care nurse roles to expand internal cessation counseling capacity</li> <li>• Modified existing patient encounter flowcharts to incorporate new standard operating procedures, such as the 5 As</li> </ul>
Modifying the EHR	<ul style="list-style-type: none"> <li>• Modified the EHR to incorporate documentation tools, such as patient tobacco use status, readiness to quit, and progress notes</li> <li>• Implemented new internal and external referral options in the EHR, such as cessation medication, cessation counseling, smoking cessation clinic, or pharmacy</li> </ul>
Monitoring data and providing feedback	<ul style="list-style-type: none"> <li>• Worked with information technology and quality departments to extract key tobacco-related data, such as tobacco use prevalence and number of referrals to cessation medications and counseling, to monitor performance</li> <li>• Tracked provider utilization of new workflows and shared with staff to identify both the successes and areas for improvement</li> </ul>

EHR indicates electronic health record.

A second facilitator was taking a team approach to implementing systems change. Although each project team was structured differently, all grantees engaged multiple levels of staff and providers to foster buy-in, as well as to design and implement new workflows and standard operating procedures. Some grantees also used surveys and meetings to obtain feedback from leadership and clinic staff to inform the design and implementation of changes. It was motivating for staff and providers to know that their input was valued. This also helped to ensure that workflows and standard operating procedures were aligned with clinic practices.

*“The [grant] Steering Committee is a really robust group of providers, nurse managers, data team members, community health staff, TTS [Tobacco Treatment Specialist] counselors, and primary care leadership.” – Project manager*

*“This team was instrumental in communication between the cessation program and clinic providers. Our clinic champion was key.” – Tobacco team member*

A third facilitator was capitalizing on internal and external priorities. Some grantees leveraged concurrent internal systemwide

process change efforts and incorporated tobacco interventions into primary care workflows. One grantee worked with its Screening, Brief Intervention, and Referral to Treatment (SBIRT)<sup>18</sup> trainer to incorporate tobacco dependence treatment education into existing SBIRT training.

A key external factor driving change was EHR Meaningful Use requirements. In 2011, CMS established the Meaningful Use incentive payment program to encourage eligible providers and hospitals to meet specific EHR criteria and reporting requirements.<sup>19</sup> Multiple grantees used Meaningful Use measures (eg, clinical quality measures for diabetes and vascular care) to justify the need for tobacco-related systems change. Project staff presented to leadership and clinic staff, highlighting how tobacco dependence treatment was tied to multiple chronic disease outcomes; inpatient readmission rates; and other clinic, departmental, and systemwide goals. This information helped demonstrate how addressing tobacco use could improve performance on critical system priorities.

*“Get on your health system’s agenda to look at population health and total cost of care. Tobacco treatment affects many other areas, and it can be prioritized once you see how it impacts overall health and healthcare savings.” – Executive champion*

Moreover, 1 grantee successfully made the case that tobacco use was highly related to system-level priorities, resulting in other departments and the health system's charitable foundation providing additional financial support.

*"I think the project manager's ability to bring a group of resources together has been the greatest accomplishment, and [getting] the resources we need." – Primary care director*

Implementing new protocols and training staff also facilitated change. Grantees embedded tobacco treatment into routine care by either modifying existing workflows or creating new standard operating procedures. Staff roles for implementing these processes were also defined.

Training and retraining staff on new protocols was crucial to improve performance. In addition, 2 grantees provided existing staff with Tobacco Treatment Specialist (TTS) training. This specialized training builds knowledge and skills to treat tobacco dependence and to integrate evidence-based treatments into health systems.<sup>20</sup> The TTSs became additional systems change champions, served as resources for providers and staff, and increased treatment delivery capacity.

*"We developed a comprehensive half-day initial training session that was effective, and succeeded in motivating our clinical staff members to embrace our tobacco control protocol." – Clinic staff*

*"The training of TTSs at the provider level has been integral for improving utilization rates and the delivery of evidence-based treatment. Training sparks a personal commitment to drive change within the clinical setting." – Clinic staff*

All grantees modified the EHR to facilitate systems change efforts. For example, some grantees included tobacco-specific templates within their EHR to allow providers and staff to more easily document patient tobacco use and refer patients to cessation resources.

*"The EHR customized modifications were appropriate for supporting our standard operating procedures." – Clinic staff*

A final facilitator of change was monitoring data and providing feedback to staff to improve compliance with new protocols. Data helped identify additional training needs to improve processes. Multiple grantees created reports using tobacco-related EHR data. Sharing these reports with staff and leadership helped to generate interest in and support for systems change processes beyond a single department or clinic.

*"Dissemination of the clinic experience has garnered the attention and support of clinic quality leadership and regional/departmental sites for replication, enhancement, and the renewed spirit that process change can and will produce positive outcomes." – Clinic staff*

### Barriers and Lessons Learned

One barrier was implementing tobacco-specific EHR changes. Many grantees had difficulty implementing these changes due to competing demands for information technology (IT) resources. Others were challenged by the amount of time that it took to make modifications. Working closely with IT staff/departments from the beginning of the project and obtaining leadership and management support helped prioritize the initial implementation of these changes.

Another barrier was keeping tobacco systems changes prioritized due to competing initiatives within the health system, finite staff time and resources, and project staff turnover. Many grantees overcame these challenges by capitalizing on other internal and external priorities, sharing data to help prioritize the work, and training existing staff members as TTSs to serve as an internal tobacco cessation resource.

A third barrier was informing all staff about new tobacco protocols and procedures. Grantees that were implementing systems changes in several clinics or departments found it challenging to communicate with all staff. Therefore, they used multiple communication methods (eg, the intranet, staff newsletters) to reach staff. Tobacco team members attended regular clinic staff meetings to provide reminders about the new protocols and answer questions. Multiple grantees also used employee orientations to train new staff.

### Sustainability

After grant funding ended, each system varied in the level of systems change activities that they were able to continue. The majority (54%-90%) of grant funds were used for personnel costs to implement systems changes. When grant funding ended, some grantees were unable to continue staffing the project, which limited or ended their ability to continue these activities. However, 1 grantee decided to create a permanent tobacco systems change position after the grant ended to continue and expand implementation of changes across their multistate system. Two other grantees continued some of the work by building it into existing staff responsibilities.

More than 1 grantee referred to their systems change grant as "seed money" that fostered their system's ability to prioritize addressing tobacco use, allowing them to build on those efforts after the grant ended. Creating a permanent tobacco systems change position is one example of this. A second example is continuing to work with

leadership to prioritize the systematic addressing of tobacco use within other areas (eg, behavioral health clinics, hospitals).

*“The overall investment of the organization in making [tobacco] a priority is one of those big success factors from my perspective.”*  
– Project manager

This work changed both clinical practice and social norms among providers and staff, which helped keep tobacco use prioritized. Many grantees developed new clinical workflows or rooming protocols, and all grantees modified their EHR to implement these new protocols. Integrating tobacco user identification and interventions into their standard of care fostered sustainability.

*“The past 2 years have been transformative for the number of engaged clinicians, the level of tobacco impact understanding, and a commitment to continue to improve and better our processes.”*  
– Clinic staff

*“The standard operating procedures are now part of our universal system. So, the systems will continue, even though the grant period is ending.”* – Chief operating officer

## DISCUSSION

Multiple factors influence how and to what extent health systems can implement systemic changes to improve identification and treatment of tobacco use. Our findings further describe both facilitators and barriers to implementing such changes and also align with the existing literature.

Engaging leadership at all levels of the organization facilitates project implementation and expansion, ensures that resources are available, and promotes sustainability.<sup>7,8,14,21</sup> Cultivating clinic champions is also important to support system integration; in particular, physician champions can significantly improve clinic performance in the delivery of cessation interventions.<sup>22</sup> The grantees in our study incorporated multiple levels of leadership across the organization into their projects and reported that this cultivated program support and garnered additional resources.

Implementing new protocols and building capacity through staff trainings are important facilitators of systems change<sup>13,14</sup> and increases staff confidence in helping patients quit using tobacco.<sup>21</sup> All of the grantees incorporated staff trainings into their projects. Some grantees also leveraged additional funds from other departments and grants to support trainings.

Additionally, effectively using data promotes action and facilitates sustainability.<sup>23</sup> The EHR can support routine clinical smoking cessation protocols and documentation<sup>9,24-26</sup> and is

a key component of systems change.<sup>14</sup> Embedding clear workflows into the EHR and utilizing “smart forms” and reports to track and link tobacco use with other health conditions can facilitate improvements in patient care.<sup>21</sup> All grantees modified their EHRs to collect data on how tobacco use was addressed during clinical encounters and to monitor performance. Data were shared with staff and leadership to create buy-in and improve processes.

Lastly, external influences, such as the Meaningful Use initiative, can affect program outcomes and sustainability. Capitalizing on environmental changes and existing initiatives can facilitate systems change,<sup>14</sup> and many grantees leveraged these factors to make the case for addressing tobacco use.

## Limitations

There are several limitations to this study. This was an observational study and we cannot conclude that changes were made solely as a result of grant funding. Although the evaluation was informed by the literature,<sup>4,8,9,14</sup> it was not designed using a specific theory or framework. The primary goal of this evaluation was to identify key facilitators, barriers, and lessons learned from each grantee’s work. It was not designed to measure long-term sustainability of changes or to identify the impact on patients (ie, patient satisfaction or quitting success). On-site observation of systems change implementation was not feasible given available resources. In addition, generalizability of these findings is limited due to the small number of health systems and the fact that all were located in Minnesota. However, many of the themes identified in this evaluation align with the health systems change literature. Furthermore, although the health systems varied in their size, reach, and population served, common themes emerged. Lastly, these health systems responded to a competitive request for proposals. Therefore, these systems had already identified tobacco use as a priority, which may have further facilitated systems change implementation.

## CONCLUSIONS

Implementing health systems change interventions is an effective way to make tobacco dependence treatment a routine part of patient care compared with clinics and health systems that have not implemented such changes.<sup>8,9</sup> Systems change activities can be tailored to meet the needs of diverse health systems. Developing system-level support, taking a team approach, capitalizing on internal and external priorities, implementing new protocols and training staff, modifying EHRs, and monitoring data and providing feedback may contribute to successful implementation. Furthermore, such changes can provide a renewed sense of enthusiasm for, and ownership of, tobacco treatment among providers and staff and can help prioritize addressing tobacco use.

### Acknowledgments

The authors would like to thank the systems change grantees and their teams for contributing to this work. Any conclusions from this project and the content of this publication are solely the responsibility of the authors and do not necessarily represent the official views of ClearWay Minnesota.

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**Source of Funding:** This study was funded by ClearWay Minnesota, an independent nonprofit organization funded with 3% of Minnesota's settlement with the tobacco industry.

**Author Disclosures:** Ms Whittet and Ms Keller are employed by ClearWay Minnesota, which funded the grants and evaluation reported in this paper. Ms Capesius and Ms Zook are employed by Professional Data Analysts, which has a consulting contract with ClearWay Minnesota and received financial compensation as part of that contract to assist with the writing and review of the manuscript.

**Authorship Information:** Concept and design (MNW, TRC, HGZ, PAK); acquisition of data (TRC, HGZ); analysis and interpretation of data (MNW, TRC, HGZ); drafting of the manuscript (MNW, TRC, HGZ, PAK); critical revision of the manuscript for important intellectual content (MNW, TRC, HGZ, PAK); and supervision (MNW, PAK).

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