Main Section of the Proposal

1. Overall Aim and Objectives:

The primary aim of this proposed project is to increase the number of tobacco-using patients admitted to two University of Washington (UW) hospitals that receive evidence-based treatment for tobacco use and dependence, as recommended by the Joint Commission (JC) revised tobacco treatment measures (TTMs). This will be accomplished by expanding and enhancing the systems, procedures and protocols of an existing in-patient tobacco cessation program that was implemented in May 2011 but falls short when it comes to the JC's new tobacco performance measure set. More specifically, the overall aim is to increase the number of hospitalized patients that are screened for tobacco use, offered and provided with evidence-based cessation counseling and approved medications, and referred for follow-up care following discharge. This will, in turn, increase the number of inpatients who quit smoking during their hospitalization and remain abstinent after discharge, thus leading to reduced prevalence of tobacco use, improved health outcomes, and lower health care costs in our community and state.

In order to meet this goal, the key objectives of the proposal are to improve compliance with the four JC performance measures as described below:

TTM-1: Tobacco Use Screening: To increase the rate of screening patients admitted to UWMC and HMC and documenting their tobacco use status.

TTM-2: Tobacco Use Treatment Provided or Offered (during hospital stay): To increase the rates of offering cessation counseling and pharmacotherapy to hospitalized patients who are identified as current tobacco users.

TTM-3: Tobacco Use Treatment Provided or Offered at Discharge: To increase rates of providing hospital discharge instructions, referrals and other resources for continuing treatment, including counseling and prescriptions for cessation medication.

TTM-4: Assessing Tobacco Use Status after Discharge: To investigate opportunities and resources for developing and implementing a new mechanism for following up with patients participating in the program and documenting their tobacco use status after hospital discharge.

The proposed project has the potential to reach 7,500 current smokers per year and help them quit tobacco use. Approximately 38,300 patients per year are admitted to University of Washington Medical Center (UWMC) and Harborview Medical Center (HMC). The two hospitals combined have 863 inpatient beds (450 at UWMC and 413 at HMC) and annual admissions of 18,800 at UWMC and 19,500 at HMC. Overall, nearly 21% of admitted patients are current tobacco users (10% of UWMC and 31% of HMC patients), with over three quarters of them at HMC. The large discrepancy in smoking prevalence between the two hospitals reflects striking demographic differences in the populations served; UWMC is a nationally acclaimed academic medical center located on the University of Washington campus, while HMC is an inner-city, Level 1 trauma center and county hospital that serves a large proportion of the indigent and mentally ill patients in our region. Since prevalence of tobacco use among patients admitted to

HMC is three times higher than it is at UWMC, there is an even a greater opportunity for impact by improving the reach and intensity of the program at HMC, so our project will focus on those areas where we can make the biggest differences, as described below.

2. Current Assessment of Need in Target Area:

Our current tobacco treatment program was implemented at UWMC and HMC in May 2011, concurrent with a new tobacco-free campus policy that prohibited smoking and other tobacco use on all hospital properties. This project was supported by a Center for Disease Control (CDC) Communities Putting Prevention to Work (CPPW) grant via the Seattle/King County public health department (PHSKC), in partnership with the Washington State Hospital Association (WSHA) and UWMC. We received substantial support from both UWMC and HMC hospital leadership and multiple departments, including Nursing, Pharmacy, Patient Safety, Health Information Technology and Human Resources to build the current program from scratch over a one-year period. This program succeeds in complying with the first two JC measures (TTM-1 and TTM-2), by identifying tobacco users, assessing their tobacco use, and offering a brief tobacco intervention to current tobacco users that includes both nicotine replacement therapy (NRT) and behavioral counseling. However, the rates of screening, offering, and acceptance of treatment are not as high as we would like to be. Additionally, the provision of discharge instructions and treatment (TTM-3) is sub-par, and a follow-up mechanism for assessing tobacco use status (TTM-4) is absent. We are confident that these shortcomings of the program can be improved through the interventions outlined in this proposal.

We conducted an evaluation following implementation of the current treatment protocol, using an electronic medical record (EMR) review of all adult (= or >18 y/o) patients admitted from May 31, 2011 to December 31, 2011 (n=22,306) at the two hospitals (UWMC and HMC). Although the hospitals use the same EMR, computerized physician order entry (CPOE) process, and tobacco treatment protocols, there are large differences in the populations served. Data showed that, overall, 79% of admitted patients had documentation of being screened for tobacco use (90% at UWMC, 69% at HMC). In terms of treatment, 77% of current smokers at HMC and 86% at UWMC were offered Nicotine Replacement Therapy (NRT), as recorded in the Registered Nurse (RN) admit assessment, and approximately 50% of those offered NRT accepted it. Counseling was offered to 70% of HMC patients and 80% of UWMC patients, of whom approximately 25% accepted. All of those who received counseling during hospitalization also received discharge instructions to remain abstinent from tobacco, to continue their cessation medication, and/or a referral for follow-up care with their primary care provider, WAQL or another resource. However, current tobacco users who had not opted to receive counseling as inpatients did not have documentation of receiving instructions regarding their tobacco use or cessation treatment at discharge. As mentioned earlier, it was not possible to create a mechanism to assess smoking status following hospitalization at that time, due to lack of resources and competing Health Information Technology (HIT) priorities within the medical center. Thus, bolstering discharge and referral processes to enhance provision of treatment when patients leave the hospital (TTM 3) and creating a new mechanism for assessing tobacco use status after discharge (TTM 4) are high priorities for improving follow-up care and thus the effectiveness of our program.

The last two elements of the JC measures (TTM-3 and TTM-4) have not been as successful as the first two in the current program, as we were not able to develop a systematic referral resource for continuing treatment or follow-up assessment/care. This was due primarily to the unexpected defunding of the Washington State Tobacco Quitline (WAQL) in July 2011, barely a month after program implementation, and which we had planned to use as our referral service provider. Thus, a major component of the program—one that the evidence base has shown to be crucial for successful long-term abstinence after discharge—has not been available for UWMC and HMC patients up to this time. Fortunately, the WAQL was refunded in July 2012, which provides us with an opportunity to refer patients for more intensive treatment during or after their hospitalization, using either a fax-referral process or by facilitating a telephone call for the patient to register with the quit line while in the hospital or at the time of discharge. The refinements described in this proposal would thus address these gaps in the intervention.

3. Technical Approach, Intervention Design and Methods:

The proposed project is designed to reduce the gaps in treatment outlined above by increasing the rates of screening for tobacco use, documenting smoking status, offering and acceptance of NRT and counseling, and providing better referral resources for continuing treatment and follow-up care after discharge. UWMC leadership has offered to support the project by designating key staff members in nursing, pharmacy, health information technology (HIT/EMR/CPOE) and the Center for Clinical Excellence (CCE) to work with the project team (PI/director and coordinator). Specifically, we plan to carefully examine every step in the current program's policies, procedures and protocols, using both data review and interviews with designated hospital staff and prior CPPW team members, to assess the reach and effectiveness of the current program, identify the strengths and weaknesses that exist, and the impact they have on meeting each of the performance measures. We will then collaborate with hospital leadership and department representatives for each of these program components, leveraging the strengths and addressing the weaknesses, to develop strategies and implement changes to create a more robust and continuous intervention from admission to discharge and beyond. This will allow us to improve the reach and effectiveness of the program and achieve better compliance with the four JC tobacco treatment recommendations in the following ways:

TTM-1) Ask about Tobacco Use and Document Status on Admission: In order to increase the rates of screening and documenting tobacco use status of patients, we plan to work with a nurse manager assigned to the project by the hospital's Nursing Director, to review current screening processes and identify barriers to using, or intrinsic inefficiencies within, the screening protocol. These would include gaps or technical difficulties that may exist on a systemic level (i.e., within the EMR-based screening form or CPOE process) or barriers at the hospital unit level (i.e., personnel or flow issues within units or floors that have lower compliance with screening and documentation). We will then work with the appropriate nurse manager and HIT personnel to develop strategies and action steps to address these issues.

TTM-2) Deliver Treatment During Hospital Stay: In order to increase the rate of providing NRT to current tobacco users, we plan to work with designated nursing and pharmacy staff to thoroughly review the steps involved with offering and providing both NRT and the brief intervention currently delivered by the hospital unit or floor pharmacist. The current process starts with the admit RN, who screens the patient for tobacco use and documents status (current, recently quit, former, never or unable to assess). Both current tobacco users (past 30 days) and those who have recently quit (> 1 month and < 1 year) are offered NRT and counseling. The RN then assesses current level of tobacco consumption and uses an algorithm to complete a check-box order form for NRT dosing and/or counseling, which is faxed to the pharmacist. We will investigate, through interviews with nursing and pharmacy staff along with reviewing EMR and CPOE records, possible "weak links" in this multi-step process that may be reducing the ultimate delivery of the medication and counseling intervention. Once the breaks in continuity are identified, we will work with the team to develop strategies for bridging the gaps and implement corrective actions.

TTM-3) Arrange for Counseling and Medication at Discharge: In order to increase the rate of referrals for continuing treatment of patients after discharge, we plan to work with designated nursing and pharmacy staff to thoroughly review the steps and technical tools used in the current discharge process to provide instructions and follow-up arrangements for the patient, including advice to remain abstinent from tobacco, offering a prescription for cessation medication (if indicated) and referring patients for follow-up care with a primary care provider (PCP), the WAQL or other resources. A set of electronically-generated messages were developed for the current program and are available for the nurse and/or pharmacist to include on the printed discharge instructions generated for all patients as they check out of the hospital. These include recommendations to remain abstinent from tobacco, continue cessation medications, follow-up with their PCP and/or to call the WAQL for further support. The intention was to have the discharge nurse or pharmacist verbally review these instructions with tobacco-using patients, although it is unknown how often this is being done. With the assistance and support of pharmacy and HIT staff, we will work together to enhance the existing system and/or create a new process to provide and document these elements of the program.

TTM-4) Assess Smoking Status ~30 Days After Discharge: As mentioned earlier, this element of the JC measure set was not included in the current tobacco cessation program, so the proposed project aims to create an entirely new mechanism for assessing tobacco use status of patients after they have been discharged. We first plan to consult with colleagues at other hospitals that already have a system in place for complying with this performance measure. This will provide us with information and models to use as we generate ideas for implementing a refined system that interfaces with the new UWMC and HMC CPOE process and is feasible in the context of existing UWMC technologies and resources. Now that the WAQL has been refunded, this resource provides a promising fax referral approach, which includes fax feedback from the WAQL regarding the patient's disposition, which can be routed back from the hospital pharmacy for entry into the EMR and/or to the PCP for follow-up.

Under our current program, UWMC nurses are responsible for screening all patients for tobacco use status, offering treatment to all current smokers/users, and ordering treatment (NRT and counseling) for patients who are interested. Pharmacists are responsible for providing the brief intervention (NRT and counseling) for our hospitalized tobacco users who have accepted the offer for treatment, as well as supplying cessation medications and discharge instructions to patients when they leave the hospital. Thus it would be a natural fit for the pharmacists to initiate the fax referral, which includes a follow-up disposition report, and enter the information from the WAQL into the EMR where the primary care physician may view it as well. The WAQL referral (by fax or phone) could also be facilitated by either nursing and/or pharmacy staff* during a more prolonged hospitalization to increase the intensity of the brief intervention and offer an additional source for behavioral and pharmacological treatment. *This could also provide an opportunity for medical, nursing, and pharmacy students to play a role in this process, learn about treating tobacco dependence in this setting, and practice the brief intervention.

Dr. Halperin recently led a CDC-funded Communities Putting Prevention to Work (CPPW) Smoke-Free Hospitals project, which assisted five King County hospitals in implementing smoke-free campus policies, including providing various levels of assistance for hospital patients, staff, and visitors to quit tobacco or remain tobacco-free while working or being treated at the hospitals. As part of this program, our CPPW team implemented the current systematic, EMR-based, in-patient tobacco treatment program for all patients who used tobacco admitted to our two main teaching hospitals, UWMC and HMC. This was accomplished through the planning and actions of a working group/task force involving leadership from the CPPW team, medical director's office, hospital administration, nursing, HIT, and pharmacy. This team developed the screening and tobacco use assessment questions, NRT and counseling protocols and order forms, and created educational materials to conduct trainings of appropriate hospital staff. Thus, our team is very familiar with the systems that are currently in place, the infrastructure of the hospitals, the people who are responsible for approving and implementing the necessary HIT and EMR changes, and the training enhancements that would be necessary to improve the reach and effectiveness of the current program.

In terms of sustainability, once the systems are established, the project should be self-sustaining as long as the WAQL remains in place. If it were defunded again, there are several options to ensure the long-term viability of the program. The CDC and National Cancer Institute are working together to bolster the national quitline (1-800-QUIT NOW) that could function as a safety net for states in the future. The American Legacy Foundation (Legacy for Health) also has an online program, *Become an Ex*, which provides web support and printed materials, and is in the process of developing a new version of their program specifically designed for a hospitalized population. We would also search for additional resources that may be available to assist with this component of the program if needed to ensure its sustainability.

In terms of dissemination of the project, there are two additional UWMC affiliated hospitals in the region (Valley Medical Center and Northwest Hospital) that have not yet adopted an in-patient treatment protocol that meets JC standards, so it is possible that this program could be

more easily expanded, especially when and if the same UWMC HIT, CPOE and EMR systems become implemented within these two hospitals.

4. Evaluation Design:

Most of the metrics that will be used for this project are the same as those used to evaluate the CPPW project that created the original inpatient treatment program at UWMC and HMC in December 2011 (as described in the *Current Assessment of Need in Target Area* section above). These measures include: Rates of screening for tobacco use by each hospital unit/floor; Tobacco use status of all patients screened (Current, Recent Quit, Former, Never, Unable to Assess); Patient offer of NRT and receipt of NRT; Patient offer of counseling and receipt of counseling during hospitalization; Discharge instructions, prescribed medication and counseling/teaching for quitting tobacco use. All of these data, described above, will be available through the EMR/HIT and CPOE systems, and can be extracted in aggregate form, without any patient identifiers. We will, additionally, strive to implement a follow-up mechanism for assessing post-discharge tobacco use status that can be included in the evaluation, although this component may be challenging to complete in the short timeframe of the project period.

Since the CPPW evaluation data were obtained one-year ago, prior to CPOE implementation at UWMC and HMC, we will conduct a new baseline assessment, using the metrics described above, but with the addition of CPOE data. This baseline assessment will also include qualitative data from interviews with nursing and pharmacy staff who have been using the existing program protocols and providing tobacco use screening and treatment, in order to obtain feedback about the facilitators and barriers to using the current systems. After the project team has identified and addressed specific gaps or weaknesses and taken steps to enhance program systems and improve compliance rates with the four TTMs, as outlined in the work plan, these same data points will be assessed at the end of the project for the final evaluation. Thus, we will be able to quantify the outcomes of the improvements we make, in terms of rates of screening for tobacco use, offer and acceptance/provision of treatment (NRT and counseling) during hospitalization, discharge instructions, teaching, medications, referrals and follow-up.

Additionally, we intend to integrate the WAQL as an additional core resource to the current treatment protocol, both for more intensive in-hospital treatment and follow-up after discharge. Patients may be connected to the WAQL by either fax referral or facilitated telephone registration. The fax-referral process automatically records and sends follow-up information about the patient's enrollment in the program via fax-back or, in some cases through the EMR, depending on the patient's health plan. The WAQL service provider is Alere Wellbeing (formerly Free & Clear), which is the vendor for 26 other state quit lines and also contracts with a large percentage of the employer health plans in Washington state to provide tobacco treatment services through the Quit for Life Program. Quit for Life offers a comprehensive tobacco cessation program which fully covers intensive counseling and all approved medications and reports back to the employer. This could offer another potential source for the follow-up assessment that our team will explore for the proposed project.

Improvements in screening rates, offers and acceptance of treatment, and discharge referrals and follow-up will translate to more intensive and widespread treatment and thus serve to increase tobacco cessation rates among patients who receive these services. While we will not be able to directly measure cessation rates until a 30-day follow-up mechanism is implemented, this can be estimated through extrapolation, based on the number of patients treated.

Detailed Work Plan and Deliverables Schedule

UWMC Inpatient Tobacco Cessation Program	Jan 2, 2013 – Jan 1, 2014											
WORK PLAN and TIMELINE	**1st Qtr**			**2nd Qtr**			**3rd Qtr**			**4th Qtr**		
	J	F	M	A	M	J	J	A	S	O	N	D
Gather info for baseline assessment of current program	X	X	X									
Identify TTM 1-3 procedures/protocols issues to be addressed	X	X	X									
Discuss ideas for improving TTM 1-3 with RN, Pharm & HIT		X	X									
Explore ideas for new TTM-4 mechanism with WAQL/AWI		X	X									
3/31/13 Deliverable 1: Baseline Assessment and Recommendations for TTM 1-4												
Discuss recommendations with key staff & create action plan			X	X	X	X						
Assign leads for project components, schedule/allot resources			X	X	X	X						
Begin implementation of proposed TTM 1-4 enhancements				X	X	X						
Identify training needs, create & begin conducting trainings					X	X						
6/30/13 Deliverable 2: Completion of TTM 1-4 System Changes/Enhancements												
Conduct remaining trainings on enhanced systems						X	X					
Monitor progress, trouble shooting and refinements						X	X	X	X			
Communicate with key staff to assess system satisfaction								X	X	X		
Collect & analyze data on enhanced TTM 1-4 components										X	X	X
Present findings to hospital leadership and other stakeholders											X	X
12/31/13 Deliverable 3: Follow-up Assessment and Final Report												

<u>Quarter 1, Jan-March, 2013:</u>

The goal for the first quarter is to complete a baseline assessment of the current inpatient treatment program, including recommendations for enhancing screening and treatment to improve compliance with the first three JC Tobacco Treatment Measures (TTM 1-3) and to implement a new follow-up assessment mechanism for TTM-4. The project team (PI/Director and Coordinator) will set up meetings with key staff members to gather information about strengths and weaknesses of the current tobacco cessation program, from the perspective of those who are providing the treatment (primarily nursing, pharmacy and medical staff) to identify areas for improvement. We will also meet with HIT and Center for Clinical Excellence (CCE) analytics teams to discuss the data retrieval and analysis plan in preparation for conducting the baseline assessment. Additionally, we will begin investigating potential resources to create a new mechanism for the fourth JC measure (TTM-4), assessing tobacco use status after discharge. We will meet with WAQL and Quit For Life representatives from Alere Wellbeing (AWI) to assess benefits and services available to different patient population groups within UWMC and HMC, as eligibility for WAQL services varies by health plan coverage and other factors (e.g., health conditions such as pregnancy, and high-risk populations such as Native Americans/Alaska Natives). We will also assess the feasibility of contracting with AWI for customized reporting, which would allow for tracking patient participation in the quit line program, with one-month quit rates, if additional funding for this component can be obtained.

3/31/13 Deliverable: Baseline Assessment and Recommendations for TTM 1-4

Quarter 2: April-June, 2013:

The goal for the second quarter is to complete implementation of the recommended enhancements and system changes to improve TTM 1-3 and create a new mechanism for TTM-4. This will be accomplished by working with our nursing, pharmacy and HIT colleagues to develop detailed action plans for each of the four TTMs. Additionally, we will designate leads for project components, and create an implementation schedule to utilize the resources allocated for this project. We will also identify training needs, develop curricula and begin conducting training sessions towards the end of the quarter or shortly after implementation of the proposed project.

6/30/13 Deliverable: Completion of TTM 1-4 System Changes/ Enhancements

Quarter 3: July-Sept, 2013:

Once the new processes and protocols have been developed and implemented, we will monitor progress in putting the new systems into place. We will also review their impacts on work flow, refine specific interventions and protocols as needed, based on troubleshooting and staff feedback, and conduct any remaining trainings on the enhanced systems. This will require continuing communication with key staff to assess satisfaction and/or problems with new systems and to address them by refining the interventions or protocols to optimize their reach and effectiveness.

Quarter 4: Oct-Dec, 2013

The main goal for this last quarter is to conduct the follow-up assessment of the proposed project components. We will collaborate closely again with the HIT and CCE analytics teams who will lead the data collection and analysis of the enhanced TTM 1-3 components and new TTM-4 mechanism. We will also produce a final report that will be shared with hospital leadership and community stakeholders. The final report will include an evaluation of all program components' implementation, patient participation and treatment outcomes.

12/31/13 Deliverable: Follow-up Assessment and Final Report