A Proposed Formative Evaluation Study
To Examine the Effects of Deploying a Physician Office EMR System on Patient Care
Version 1.0 – March 30/2010

1. Purpose

This document describes a proposed formative evaluation study to examine the effects of deploying a physician office electronic medical record (EMR) system on patient care. This proposal is a collaborative effort between a team of health informatics researchers at the University of Victoria (UVic Team) and the physician community of practice in the Beta Community of Practice (Beta-CoP). The objectives and scope of this study are to:

(a) Initiate a small-scale study for 6 months to explore the feasibility of engaging the Beta-CoP to evaluate a new physician office EMR system that is currently being deployed in the community;
(b) Refine the EMR evaluation design and logistics so they are relevant to and feasible for the Beta-CoP;
(c) Leverage this study as the foundation of a multi-year EMR evaluation proposal to seek external funding;
(d) Align with existing initiatives where feasible, such as the BC Medical Association (BCMA) hypertension guidelines, BC's Physician Information Technology Office (PITO) program, Canadian Institute for Health Information's primary health care indicators project [1] and Infoway's pan-Canadian EMR strategy;
(e) Address the question of *"whether the adoption/use of a physician office EMR system can enhance practice performance, patient outcomes and overall satisfaction."* Our initial focus will be on the use of EMR in prescribing practice and hypertension (HTN) management.

By taking part in this formative evaluation study, there are potential benefits to be gained for the physician practice community, the EMR vendor and others involved.

For the physician community, the expected benefits include but are not limited to:
(a) Opportunity to examine own processes and identify areas for improvement within the practice
(b) Opportunity to provide feedback for EMR enhancements
(c) Contribution to new research
(d) Access to newly developed evaluation methodologies and tools
(e) Entry of data into EMR
(f) Dissemination of findings throughout the community of practice
(g) Remuneration or potential CME credit for participation

For the EMR vendor, the expected benefits include but are not limited to:
(a) Validation of EMR usability
(b) Opportunity to highlight available features
(c) Obtain user feedback for EMR improvement
(d) Contribution to new research

2. Evaluation Approach

2.1 Research Methods/Design. For this study, we propose an action research oriented approach using the Rapid Response Evaluation Methodology (RREM) that we have developed at the UVic eHealth Observatory [2]. Our methods cover EMR benchmarking, usability engineering, productivity modeling, impact assessment and practice reflections. The study is a 6-month pre/post intervention design with 3 comparison groups assessed at month-1 pre-deployment then at month-5 post-deployment, respectively. The key design/method elements are:

(a) **Sites/participants:** Three practice sites are suggested - two Beta-CoP practices each with 3-4 family docs planning to deploy EMR this fall as the two study sites, and the 4-5 physicians in Beta-CoP who first piloted

the EMR in the summer. These sites should be using the HTN care flowsheet but not be part of the BCMA chronic disease management practice support program (see Appendix A for HTN flowsheet and guidelines). Participants at each site may include nurse practitioners or other staff members as EMR users.

(b) **Intervention:** This is defined as the new EMR system that is being deployed in the community. Note that the change management process is a distinct aspect of deployment that will be examined (separate from PITO) as it can have an effect on the adoption/use and impact of the EMR being implemented.

(c) **EMR benchmarking:** Applying our revised 5-stage EMR adoption model [3] to determine the level of EMR adoption and usage associated with a given practice pre/post EMR deployment.

(d) **Usability engineering:** Conducting usability test scenarios to determine the usefulness/ease-of-use of ePrescribing, comparing first time users from the two study sites to those at the pilot site with more experience.

(e) **Productivity modeling:** Examining prescribing practice and processes through workflow/task analysis and work sampling pre/post EMR deployment. These processes will be compared with proposed conceptual prescribing models from our eHealth Observatory for assessment of EMR adoption level with respect to prescribing workflow [4].

(f) **Impact assessment:** Conducting in-person interviews and HTN clinical data analysis to assess the effects of EMR deployment on practice performance, patient outcomes and overall satisfaction. The change management process will also be examined using the Pare project risk assessment framework [5].

(g) **Practice reflections:** Engaging participants in focus group reflective sessions with EMR expert physician facilitators (part of the UVic Team) to share information, provide feedback and identify practice improvement opportunities pre/post EMR deployment.

2.3 Evaluation Metrics. The suggested measures for this study are based on Infoway's benefits evaluation (BE) framework of EMR quality, use/satisfaction, and net benefits (see Appendix B) [6]. Where feasible, the measures will be obtained pre/post EMR deployment to look for changes. The suggested measures include:

(a) **System features and data quality:** For EMR system quality the metrics are: (i) ePrescribing features present based on basic PITO and other requirements and (ii) flowsheet data quality for completeness and accuracy.

(b) **System usage and satisfaction:** For EMR use/satisfaction the metrics are: (i) pattern of actual EMR use, e.g. duration, frequency and functions (specifically ePrescribing features); (ii) ease-of-use of EMR interfaces/reports; and (iii) perceived usefulness and value for physicians/staff including practice-patient relationships.

(c) **Patient safety:** For net benefits care quality the safety metrics are: (i) medication error rates in terms of actual/potential prescribing errors and adverse reactions/events and (ii) rates of medication reviews/changes.

(d) **Appropriateness/effectiveness:** For net benefits care quality the appropriateness/effectiveness metrics are: (i) HTN guideline adherence rates for management of hypertension and (ii) HTN guideline adherence rates on follow-up visits for HTN patients.

(e) **Health outcomes:** For net benefits care quality the outcome metrics are: (i) physiologic parameters within target range.

(f) **Efficiency:** For net benefits as productivity the efficiency metrics are: (i) time to complete prescribing tasks and (ii) ratios of ePrescribing/manual tasks. These will be based on usability test scenarios.

(g) **Implementation:** – As part of the extended BE framework under Implementation, change/risk management focuses on the technological, human, usability, managerial and strategic/political aspects of EMR deployment as to whether/how they are being addressed by the PITO EMR implementation team [7]. Also included are practice improvement opportunities and shareable lessons identified (independent of PITO efforts).

2.4 Data Collection and Analysis. These tasks will be done by the UVic Team with help from the three practice sites. Up to six data collection tasks will be performed pre/post EMR deployment where appropriate. These are interviews, observations, usability test scenarios, chart reviews, data extraction and focus groups. There are two data analysis tasks - thematic analysis of qualitative data, and statistical analysis of quantitative data (chart review

and EMR data). These data collection/analysis tasks and the types of evaluation metrics (*in italics*) involved are described below. Also see mapping of data collection tasks to evaluation methods and metrics in Appendix C.

(a) **Interviews:** We will conduct physician/staff interviews at each site as part of: benchmarking to gauge their EMR *adoption level and use of system features*; productivity modeling to identify *ePrescribing features*, prescribing *task ratios* and change in *use and processes*; impact assessment for perceived usefulness/value. In addition, vendor representatives will be interviewed to determine available EMR features.
(b) **Observations**: We will conduct observations of the prescribing process as part of productivity modeling to identify *features*, *task ratios*, and *actual use/processes*.
(c) **Usability Test Scenarios:** We will have two users from each site complete 4-6 ePrescribing scenarios with varying complexities to gauge the EMR's *ease-of-use*, *perceived usefulness/value*, *ePrescribing features and task completion time*.
(d) **Chart Review:** Anonymized data will be extracted from patient charts and HTN flowsheets over a predefined period to examine *medication error rates*, *medication review/change*, *guideline adherence*, *physiologic parameter values*. At pre-deployment, we suggest entering patients' HTN flowsheet and relevant data into the EMR as part of historical data conversion for extraction (time period based on funding/resource availability that will be provided as part of the study).
(e) **EMR Data Extraction:** We will retrieve anonymized EMR data on patients seen over a predefined period in terms of *medication error detection*, *medication review/change*, *guideline adherence*, *physiologic parameter values*, and *system usage log*s.
(f) **Focus Groups:** We will conduct focus group sessions with 4-6 physician/staff at each site to find out their perceptions of *system usefulness/value* and PITO *change management process*, and suggestions for *practice improvement* and *lessons learned*.

3. Work Plan Details

3.1 Tasks and Timelines. The UVic Team and Beta-CoP need to work collectively on the following tasks and suggested timelines in order to take on this study from Nov2009 to Apr2010:

(a) Review, revise and approve this proposal, including the project/governance structure, by Sep30/09
(b) Confirm team, sites/participants, governance and timelines, including time commitments, by Oct 15/09
(c) Engage with vendor as part of study to review functionality, including ability for practices to run anonymized reports for evaluation
(d) Prepare multi-year evaluation proposal in Sep-Oct2009 for submission to funding agencies in early 2010
(e) Conduct fieldwork to collect data in Nov-Dec09 and Feb-Mar10 as the pre/post EMR deployment periods
(f) Analyze data and produce results in Jan10 and Apr10 for the pre/post EMR deployment periods
(g) Engage participants in practice reflections in Jan10 and Apr10 as the pre/post EMR deployment periods
(h) Write up study findings and lessons for sharing and publication in Apr 2010

3.2 Resources and Budget. The suggested resources and the associated costs for this study are outlined below.

(a) The UVic eHealth Observatory will provide up to two EMR evaluation teams each consisting of 1 physician expert and 1 analyst working part-time on the study over a 6-month period (at no cost to Beta-CoP).
(b) The Beta-CoP will arrange three practice sites for the study and facilitate/coordinate among the UVic Team, study sites, EMR vendor, BCMA-PITO and others as needed.
(c) Each practice site will need to identify a physician champion and designated staff to coordinate at the site.
(d) Depending on physician/staff availability at each study site, the eHealth Observatory can provide funding for clinical release, data entry/extraction and coordination time, and travel expense as needed.

3.3 Issues for Considerations. Different issues have been identified by the Beta-CoP and UVic Team members during the initial planning stage of this pilot evaluation study. These issues are summarized below:

(a) We have to keep this study practical and feasible in terms of time commitment from the physicians, and to better define what they can gain from taking part in the pilot.
(b) The time commitment for each physician/staff per site is estimated at 23 hours over 6-months, plus another 12 hours one-time data conversion for staff to enter the historical HTN flowsheet and relevant data into the EMR for each physician practice (see Appendix D). The actual hours can vary depending on physician/staff present.
(c) Three visits by the UVic Team are planned for each site at month-1 and month-5 to collect data, and month-6 to present findings. Each visit can take place at various times over **one month** to accommodate the office practice schedules.
(d) No change to the EMR is planned/needed for the 6-month pilot evaluation (e.g. no alert/reminder).
(e) The usability testing and productivity modeling methods will be based on simulated prescribing scenarios only, not on real patient cases.
(f) Collaboration with PITO and the vendor is desirable to synchronize deployment and assessment activities. For PITO this involves having the UVic Team to assess the PITO EMR-deployment process; for the vendor it may involve having their experts take part in usability benchmarking.
(g) The UVic Team will NOT be involved with the PITO EMR deployment process; it will only assess the process by applying the extended Infoway BE framework for change/risk management.
(h) Because the pilot is only for 6-months, we will not examine co-morbidity or involve patients in the study; however, this will be part of the broader, 2-year study design.
(i) As part of this study, the UVic Team will need access to anonymized EMR data extracted from the practice sites to examine changes in practice performance and patient outcomes. The UVic Team will be responsible for obtaining ethics approval from its UVic Ethics Review Board before obtaining the anonymized dataset.
(j) The UVic team will explore the feasibility of CME credits for Beta-CoP physicians involved in this study.
(k) Once Beta-CoP agrees in principle to proceed with this pilot, the UVic team will expand on design details (e.g. historical EMR data collection/extraction procedures, clarification of evaluation metrics). A 1-page overview document will be provided to explain this study to the physician community and why they should take part, e.g. CME credits, practice profile feedback, historical medical summary data, etc.

References

[1] Canadian Institute for Health Information. *Primary Health Care Indicators EMR Content Standards*, V 1.0. Ottawa, 2008.

[2] Lau F, et al. *A Rapid Response Evaluation Methodology for Physician Office EMR Systems*. UVic eHealth Observatory, unpublished, Jun30/09.

[3] HIMSS and HIMSS Analytics. *Electronic Medical Record Capabilities and Expected Benefits in US Non-federal Hospitals and Physician Clinics*. Dec 17, 2008. URL: http://www.himss.org/advocacy/d/emr_outcomes20081217.pdf, Jun5/2009.

[4] Partridge C, Bassi J, et al. *Electronic Prescribing Workflow Patterns and Assessment Tool*; work-in-progress, Aug 2009.

[5] Pare G, Sicotte C, Jaana M, Girouard D. Prioritizing clinical information system project risk factors: a Delphi study. *Proceedings 21st Hawaii International Conference on System Sciences*, Hawaii, Jan 5-7, 2008.

[6] Lau F, Hagens S, Muttitt S. A proposed benefits evaluation framework for health information systems in Canada. *Healthcare Quarterly* 2007; 10(1):112-8.

[7] Lau F, Extending the Infoway benefits evaluation framework for health information systems. *Proceedings ITCH 2009*, February 22-24, 2009.

Appendices

Appendix A – HTN Flowsheet, HTN Guidelines from BCMA
Appendix B – Canada Health Infoway Benefits Evaluation Framework
Appendix C – Mapping of Data Collection Tasks to Evaluation Methods and Metrics
Appendix D – Practice Site Time Commitment Estimates
Appendix E – Time Estimates for Data Collection by Activities
Appendix F – Activities Grouped into Time Blocks (per practice site)

Appendix A - HTN Flowsheet, HTN Guidelines from BCMA

BRITISH COLUMBIA The Best Place on Earth | Ministry of Health

HYPERTENSION CARE FLOW SHEET

This Flow Sheet is based on the Hypertension Guideline
Web site: http://www.bcguidelines.ca

BRITISH COLUMBIA MEDICAL ASSOCIATION | Guidelines & Protocols Advisory Committee

NAME OF PATIENT	SEX ☐ M ☐ F	DATE OF BIRTH	AGE AT DIAGNOSIS

CARE OBJECTIVES

RISK FACTORS AND CO-MORBID CONDITIONS (NOTE: if patient also has DM and/or CHF, use respective flowsheet instead)

☐ Obesity — HEIGHT (cm)

DATE	BMI (kg/m²)	TARGET
		Normal: 18.5-24.9 Overwt: 25-30 Obese: ≥30

DATE	WAIST CIRC.	
		Male (cm) Caucasian ≤ 102 Asian ≤ 90 Female (cm) Caucasian ≤ 88 Asian ≤ 80

☐ CVD _____
☐ Dyslipidemia
☐ Kidney
☐ Review BP:
  ☐ <140/90 no co-morbid condtions
  ☐ ≤130/80 DM, renal disease or end organ damage
☐ Other: _____

☐ Smoker
☐ Alcohol (assess/discuss)
☐ Gout
☐ Asthma
☐ Allergy: (e.g. ASA)

SELF MANAGEMENT (Discuss with patient)

☐ Explain the consequences of hypertension
☐ Review meds & adverse effects
☐ Smoking cessation: *Quit Now*
  Phone toll free in BC: 1 877 455-2233
☐ Refer to guideline & patient guide
☐ Set goals with patient (See reverse):
  • Promote weight loss & exercise
  • Avoid excessive alcohol
  • Reduce salt intake & improve diet
☐ Copy of Flow Sheet to patient if appropriate
☐ Other: _____

VISITS (3 TO 6 MONTHS)

DATE	BP	WEIGHT Lbs | Kg	NOTES (REVIEW RISK FACTORS, GOALS, & CLINICAL STATUS.)	BP MEDICATION NOTES
				BASELINE (Note allergies, side effects & contraindications) *Consider low dose ASA if age 50-70 & ≥ 20% CHD risk
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE
				☐ NO CHANGE

REMINDERS: **1) CONSIDER END ORGAN DAMAGE: EYES, HEART, CIRCULATION, KIDNEYS**
2) SEE REVERSE FOR LIFESTYLE MANAGEMENT & TREATMENT RECOMMENDATIONS

ANNUALLY (UNLESS NOT CLINICALLY INDICATED)

LIPIDS				FRAMINGHAM 10-YR RISK
DATE	TC	LDL	TC/HDL	%
DESIRABLE		< 3.5	<5.0	MOD 10-19%
		< 2.5	<4.0	HIGH ≥ 20%

KIDNEY		
DATE	ACR	eGFR
TARGETS	M: < 2.0 F: < 2.8	> 60

CONSIDER TESTING EVERY SECOND YEAR IF LESS THAN 10% CHD RISK

VACCINATIONS (If ≥ age 65 or has other risk factors)

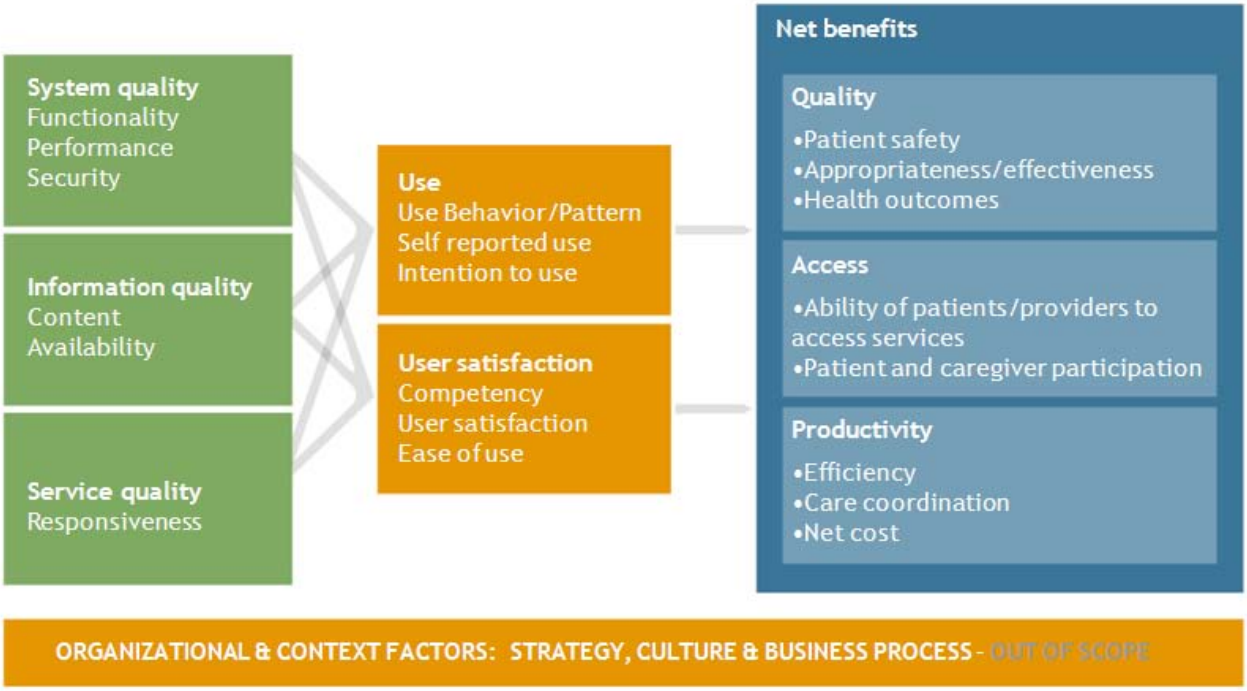
Annual Flu: DATE _____ DATE _____
Pneumovax: DATE _____

HLTH/BCMA (REV 07/07)

BILLING CODE: 14052 DIAGNOSTIC CODE: 401 BILLING: DATE _____ DATE _____

Appendix B - Canada Health Infoway Benefits Evaluation Framework

(a) Infoway BE framework HIS quality, use and net benefits dimensions



(b) Examples of evaluation metrics for the net benefits dimensions of quality, access and productivity

Change in patient safety
- **Medication errors and Adverse Drug Events**

Change in health system outcomes
- **Readmission rates**
- **Efficiency of recovery**
- **Patient transfers**

Change in provider effectiveness / appropriateness of care
- **Access to information**
- **Timeliness of service delivery, pharmacists, public health, referring physicians, radiologists**
- **Vaccination rates, Outbreak detection and intervention**

Change in access to services
- **Volume of service provision**
- **Access to previously unavailable services**
- **Timeliness of DI services**

Change in patient and caregiver participation
- **Patient awareness and adherence**

Change in provider efficiency
- **Radiology Technologist and Radiologist efficiency**
- **Pharmacists and Lab technician callbacks**
- **Time to take medication history or assess patient**
- **Clinician workflow**

Change in coordination of care
- **Information sharing among different providers**
- **Management of outbreaks**

Change in net costs
- **Unnecessary events: radiology, lab tests, vaccinations**

Appendix C – Mapping of Data Collection Tasks to Evaluation Methods and Metrics

By Evaluation Methods	**Interviews**	**Observations**	**Usability Test Scenarios**	**Chart Review**	**Data Extraction**	**Focus Groups**
EMR benchmarking						
5 stage EMR adoption model assessment	√					
Usability engineering						
ePrescribing scenarios	√		√			
Work sampling of prescribing tasks for completion time						
Productivity modeling						
Workflow/task analysis of prescribing process	√	√				
Impact assessment						
Qualitative assessment on performance, outcomes, satisfaction	√					√
Quantitative assessment on performance, outcomes, satisfaction				√	√	
Deployment process thru change/risk management assessment	√					√
Practice reflections						
Focus groups for info sharing, feedback, identifying improvements						√
By Evaluation Metrics						
System features and data quality						
ePrescribing features	√		√			
Flowsheet data quality – completeness/accuracy				√	√	
System usage and satisfaction						
Actual EMR use patterns		√	√		√	
Ease-of-use			√			√
Perceived usefulness/value for physicians/staff	√					√
Patient safety						
Actual/potential medication error rates				√	√	
Rates of medication review/change				√	√	
Appropriateness/effectiveness						
Guideline adherence rates for HTN management				√	√	
Guidelines adherence on follow-up HTN visits				√	√	
Health outcomes						
Physiologic parameters in target range				√	√	
Efficiency						
Time to complete prescribing tasks	√		√			
Ratios of ePrescribing/manual tasks	√		√			
Implementation						
Change/risk management with Pare's risk assessment framework*	√					√
Identifying practice improvement opportunities	√					√
Sharing lessons learned	√					√

*Pare's framework- addressing the technological, human, usability, managerial and strategic/political aspects during EMR deployment

Appendix D – Practice Site Time Commitment Estimates

(a) Time estimates for data collection tasks by evaluation method for each physician practice site* over 6 months

Data Collection Tasks / Evaluation Methods	Participant	Month-1	Month-5	Month-6	Total
Interviews					
EMR benchmarking	Physician/staff	2 hr	2 hr		4 hrs
Productivity modeling	Physician/staff	1 hr	1 hr		2 hrs
Impact assessment – quantitative/qualitative	Physician/staff	1 hr	1 hr		2 hrs
Impact assessment – deployment process	Physician/staff	1 hr	1 hr		2 hrs
Usability Engineering – post questionnaire	Physician/staff	30 min	30 min		1 hr
Observations					
Productivity modeling (with interviews)	Physician/staff				
Usability Engineering					
Usability ePrescribing test scenarios	Physician	1 hr	1 hr		2 hrs
Data Extraction					
Impact assessment - quantitative	Staff	2 hrs	2 hrs		4 hrs
Practice Reflections		2 hrs	2 hrs	2 hrs	6 hrs
Impact assessment – qualitative	Physician/staff				
Impact assessment – deployment process	Physician/staff				
Focus groups	Physician/staff				
Sub-total		11.5 hrs	9.5 hrs	2 hrs	23 hrs
Chart Review					
Impact assessment – quantitative	Staff	10 hrs	2 hrs		12 hrs
Total		20.5 hrs	12.5 hrs	2 hrs	35 hrs

*Note – the time estimates refer to each physician at a site; so if there are two physicians at a site the total for that site is 70 hrs.

Time estimates for data collection tasks for vendor over 6 months

Data Collection Tasks / Evaluation Methods	Participant	Month-1	Month-5	Month-6	Total
Interviews					
Determine EMR features	Vendor	2 hrs			2 hrs
Total		2 hrs			2 hrs

(b) Elaboration on the time estimates for data collection tasks by evaluation method

- **Interviews** – Up to five interviews with a physician and/or a staff member each lasting 1-2 hours are planned in month-1 pre-deployment then again in month-5 post-deployment to examine EMR level, ePrescribing process and impacts for system use, efficiency and deployment, and usability engineering; one interview with a vendor representative is planned to determine available EMR features
- **Observations** – One observation with a physician and/or a staff member lasting 1-2 hours is planned in month-1 then again in month-5 to examine ePrescribing processes
- **Usability Engineering**– One usability test session with a physician lasting 1-2 hours is planned in month-1 then again in month-5 to examine ePrescribing for EMR features, actual/ease of use and efficiency
- **Data extraction** – Up to 2 hours are planned for staff to extract anonymized data from EMR in month-1 then again in month-5 for data quality, system use, patient safety, guideline adherence and physiologic parameters
- **Practice reflections** – Up to 2 hours are planned for physicians and/or staff to take part in practice reflections in month-1, month-5 and month-6 on system use and implementation
- **Chart review** – Up to 10 hours are planned for staff to enter historical HTN flowsheet and related data (e.g. medication errors, adverse events) into the EMR in month-1, then 1-2 hours again to track the EMR HTN flowsheet and related data in month-5 for data quality, patient safety, guideline adherence and physiologic parameters within range; will consider hiring medical students to work part time and/or residents as part of their residency requirement for research projects

Appendix E – Time Estimates for Data Collection by Activities

Time estimates for data collection tasks by activities for each physician practice site* over 6 months

	Mth-1	Mth-5	Mth-6	Participant	Total Time
EMR Benchmarking Understand current level of EMR adoption within the practice, what features are being used and what features could potentially be used					
Complete survey to determine level of EMR adoption (conducted as an interview to ascertain objectives for EMR implementation)	1 hour	1 hour		Physician/Staff Member	2 hours
Complete interview to determine list of available EMR features	2 hours			Vendor representative	2 hours
Complete interview to determine use or intended use of EMR features	1 hour	1 hour		Physician/Staff Member	2 hours
Usability Engineering Demonstrate how tasks are completed in the EMR, opportunity to explain problems encountered during normal use and ideas for improvement					
Complete 2-3 normal condition test scenarios	30 min	30 min		2 Selected Physician/Staff Members	1 hour
Complete 2-3 think-aloud test scenarios	30 min	30 min		2 Selected Physician/Staff Members	1 hour
Complete post study system usability questionnaire in semi-structured interview	30 min	30 min		2 Selected Physician/Staff Members	1 hour
Productivity Modeling Examine current workflow processes for prescribing and identify areas for improvement					
Complete interview/observations to assess workflow level using EMR to demonstrate (if implemented)	1 hour	1 hour		Physician/Staff Member	2 hours
Impact Assessment Examine and understand the impact of implementing the EMR on practice performance and patient outcomes; share overall satisfaction with EMR deployment					
Enter information from HTN flowsheet and patient chart into EMR	10 hours	2 hours		Resident/Medical Student or Staff	12 hours
Extract data from EMR for study	2 hours	2 hours		Resident/Medical Student or Staff	4 hours
Complete interview for overall satisfaction	1 hour	1 hour		Physician/Staff Member	2 hours
Complete interview for deployment process	1 hour	1 hour		Physician/Staff Member	2 hours
Practice Reflection In a group, provide feedback and share ideas for practice improvement pre/post EMR deployment					
Complete a focus group session	2 hours	2 hours	2 hours	4-6 Physician/Staff Members	6 hours
TOTAL HOURS	22.5 hours	12.5 hours	2 hours		37 hours

*Note – the time estimates refer to each participant at a site unless otherwise specified. For example, if there are two physicians interviewed, the time shown would be doubled if interviewed separately.

Appendix F – Activities Grouped into Time Blocks (per practice site*)

Month	Day	UVicTeam	Time Block	Activity	Method	Participant
1	0	At vendor office	2 hours	EMR Benchmarking	Complete interview to determine list of available EMR features	Vendor
	1	1 hour	1 hour	EMR Benchmarking	Complete survey to determine level of EMR adoption (administered with an interview to ascertain objectives for EMR implementation)	Physician/Staff Member Unit
	2	3.5 hours	1.5 hours	Usability Engineering	Complete 2-3 normal condition test scenarios	Physician/Staff Member Unit
				Usability Engineering	Complete 2-3 think-aloud test scenarios	Physician/Staff Member Unit
				Usability Engineering	Complete post study system usability questionnaire in semi-structured interview	Physician/Staff Member Unit
			2 hours	Productivity Modeling	Complete interview/observations to assess workflow level using EMR (if implemented)	Physician/Staff Member Unit
				EMR Benchmarking	Determine use or intended use of EMR features	Physician/Staff Member Unit
	3	4 hours	2 hours	Impact Assessment	Complete interview for overall satisfaction	Physician/Staff Member Unit
				Impact Assessment	Complete interview for deployment process	Physician/Staff Member Unit
			2 hours	Practice Reflection	Complete a focus group session	4-6 Physician/Staff Members
	?		10 hours	Impact Assessment	Enter information from HTN flowsheet and patient chart into EMR	Resident/Medical Student or Staff
	?		2 hours	Impact Assessment	Extract data from EMR for study	Resident/Medical Student or Staff
5	1	1 hour	1 hour	EMR Benchmarking	Complete survey to determine level of EMR adoption (administered with an interview to ascertain objectives for EMR implementation)	Physician/Staff Member Unit
	2	3.5 hours	1.5 hours	Usability Engineering	Complete 2-3 normal condition test scenarios	Physician/Staff Member Unit
				Usability Engineering	Complete 2-3 think-aloud test scenarios	Physician/Staff Member Unit
				Usability Engineering	Complete post study system usability questionnaire in semi-structured interview	Physician/Staff Member Unit
			2 hours	Productivity Modeling	Complete interview/observations to assess workflow level using EMR (if implemented)	Physician/Staff Member Unit
				EMR Benchmarking	Complete interview to determine use or intended use of EMR features	Physician/Staff Member Unit
	3	4 hours	2 hours	Impact Assessment	Complete interview for overall satisfaction	Physician/Staff Member Unit
				Impact Assessment	Complete interview for deployment process	Physician/Staff Member Unit
			2 hours	Practice Reflection	Complete a focus group session	4-6 Physician/Staff Members
	?		2 hours	Impact Assessment	Enter information from HTN flowsheet and patient chart into EMR	Resident/Medical Student or Staff
	?		2 hours	Impact Assessment	Extract data from EMR for study	Resident/Medical Student or Staff
6	1	2 hours	2 hours	Practice Reflection	Complete a focus group session	4-6 Physician/Staff Members

Total Hours for Participants

Month	Day	Physician/Staff Member	Resident/Medical Student or Staff	Vendor	All
1	0		12	2	22.5
	1	1			
	2	3.5			
	3	4			
5	1	1	4		12.5
	2	3.5			
	3	4			
6	1	2			2
TOTAL		19	16	2	37

*Note – the time estimates refer to each participant at a site unless otherwise specified. For example, if there are two physicians interviewed, the time shown would be doubled if interviewed separately.