SECTION 1
QUALITY ASSURANCE OVERVIEW

INTRODUCTION

The Women's Health Initiative (WHI) Quality Assurance (QA) Program consists of the implementation and routine use of various quality assurance methods in an organized, planned manner. It is an integral part of the WHI study protocol, procedures, and database. The program covers all aspects of WHI, from the development of the protocol to interpretation of results.

For WHI, QA methods and responsibilities include activities performed at the Clinical Centers (CCs) as well as activities initiated and coordinated by the Clinical Coordinating Center (CCC). Although the WHI QA Program is directed primarily at CC operations, it is based upon comprehensive, study-wide standards of quality. Clinical Center and CCC responsibilities and activities are based on a QA plan that establishes priorities for high quality data and conduct while preserving efficient and cost-effective operations. The basis of the QA program is to build quality into the system, ensure that all WHI staff are appropriately trained, set meaningful standards, use multiple methods to detect errors, provide feedback, and assure standards are maintained. Required and recommended QA activities for WHI balance what is necessary with what is possible and cost effective.

This manual includes the following sections:

Section 1 - Overview gives an overview of the WHI QA Program and summarizes its priorities.

Section 2 - Documentation describes the WHI Manuals, which contain the WHI protocol, forms, and documentation of WHI procedures. It also describes methods for providing documentation updates and answering procedural questions using the Inquiry Reporting System, and electronic files available to the CCs.

Section 3- Training and Certification describes training requirements and procedures for CC staff to certify the training activities.

Section 4 - Observations describes observations required for certification and other QA activities, gives the equipment monitoring schedule, and describes CC and CCC activities for CCC QA visits to the CCs.

Section 5 - Data Monitoring describes reports available for monitoring CC activities, including routine reports produced by the CCC, various types of reports CCs can run to monitor their activities, and gives CCs a schedule for running reports.

Section 6 - Performance Monitoring includes performance goals for various CC activities, and describes the performance monitoring plan and the functions of the Performance Monitoring Committee.

The Appendices in this volume contain specific QA resource materials, such as Certification Forms and Training/QA Checklists.

1.1 WHI QA Program Overview

The WHI QA program focuses on the following areas:

- Integrity of Primary Clinical Trial (CT) Results

The WHI Protocol (in Volume 1) describes the design and goals for both the Clinical Trial (CT) and the Observational Study (OS). Adherence to the CT design is essential for assuring the proper interpretation of the results, thus the QA Program includes monitoring the following essential CT activities:

  - Eligibility
  - Randomization
  - Blinding
  - Intervention, Adherence, and Retention
  - Outcomes

- Participant Safety

Quality Assurance procedures for ensuring participant safety include:

  - Procedures that are performed as specified in the WHI Manuals and in accordance with usual standards of medical care.
  - Potential problems, side effects, and adverse events that are managed appropriately.

- Ethical Conduct

Research involving human subjects must undergo a comprehensive review to assure ethical conduct. Study investigators at the National Institutes of Health (NIH), CCC, CCs, and the WHI Data and Safety Monitoring Board (DSMB) have reviewed the protocol, procedures, and participant materials and have approved the WHI model consent forms. (See *Vol. 1 - Study Protocol and Procedures, Section 2 - Consent Forms.*)

Model consent forms are included in the Protocol appendices. Each CC is responsible for keeping their consent forms up-to-date and for submitting them to the local IRB for approval. The Project Office centrally reviews new or revised CC consent forms for accuracy and completeness before the consent forms may be used.

Quality Assurance priorities for ethical conduct include:

  - Obtaining full, uncoerced, informed consent.
  - Collecting accurate participant information.
  - Preserving confidentiality of participant information.
  - Providing referrals and appropriate medical information to participants' health care providers.

- Valid and Reliable Data Collection

The WHI is a multicomponent, multicenter study of long duration that involves large numbers of women. These factors contribute to the unique nature of this research endeavor, and also increase the complexity of data collection and management activities.

Quality Assurance priorities for assuring valid and reliable data include monitoring that:

  - Data collected are complete and accurate.
  - Procedures used to collect, review, process, and enter data are standardized and consistent.
  - Procedures used to label and handle specimens are accurate, standardized, and consistent.
  - Data editing is accurate and appropriate.
  - Management of data is organized and timely.

1.2 Priorities

The WHI QA program seeks to balance the need to assure scientific quality of the study with available resources (time, money, and staff). The complexity, size, and fiscal responsibility of WHI necessitate establishing priorities to guide CC and CCC QA activities.

The WHI QA priorities were developed under the premise that aspects critical to the main components of WHI would be of highest priority. As the centerpiece of WHI, the fundamental elements of the CT are considered of highest priority. The next highest priority is given to key elements of the OS and elements of the CT that are important for interpretive analyses. The remaining elements are given a lower priority. *Table 1.1 - WHI QA Priorities* gives a basis for assessing the priorities of both CC and CCC QA activities for both the CT and OS.

The implementation of these priorities is manifested in the frequency and level of detailed QA methods applied to both CC and CCC QA activities.

- Priority 1 items receive rigorous routine review and monitoring, both centrally and locally.
- Priority 2 items receive review at a reduced level, often with only local monitoring or central review limited to data monitoring.
- Priority 3 items are addressed on a time available basis. Because the training and QA for some priority 3 items are identical to those of higher priority, there may be adequate carry-over effects from the higher priority activities to assure adequate performance. Continued monitoring of these areas is done to allow the detection of severe problems.

Table 1.1
WHI QA Priorities

Priority 1	CT Informed Consent CT Randomization CT Interventions, Adherence and Retention CT Safety CT Primary Outcomes
Priority 2	CT Blinding CT Eligibility OS Primary Outcomes OS/CT Biological Specimens OS/CT Baseline Predictive Data CT Follow-up Predictive Data
Priority 3	OS Informed Consent OS Enrollment OS Follow-up Predictive Data CT/OS Subsidiary Outcomes CT/OS Ancillary Study Interference

1.3 Quality Assurance Methods

The WHI QA responsibilities include study-wide requirements initiated and coordinated by the CCC as well as CC-established requirements and activities. The following standardized methods are used to maintain quality throughout the WHI :

- Document Procedures
- Train Staff
- Certify/Recertify Staff
- Observe Procedures
- Monitor Data (Completeness, Validity, Timeliness, Reliability)
- Establish and Monitor Performance Goals
- Provide Feedback

Each aspect of WHI can be evaluated using one or more of these methods. Clinical Centers and the CCC often share accountability for QA and each have specific responsibilities for assuring the quality of certain areas. The other sections in this manual give details of these responsibilities and methods. The WHI committee structure may prioritize QA activities so that multiple methods are used to assure quality in selected areas.

Section 1
Quality Assurance Overview

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SECTION 3
TRAINING AND CERTIFICATION

INTRODUCTION

The purpose of training within WHI is to teach staff the WHI protocol and procedures for implementation at the Clinical Centers (CCs). The CCC conducted initial training sessions for all lead staff positions at the time of CC start-up. Replacement lead staff training's are held approximately every six months, as needed. In addition, national meetings may include training-like sessions for appropriate CC staff. CC lead staff are responsible for training CC non-lead staff.

Initial certification and regular recertification ensures that staff have a general understanding of the study procedures, have mastered an acceptable performance standard, and have maintained their skills. Lead staff and all other CC staff responsible for data collection or performing specific WHI procedures must be initially certified for the specific tasks they perform and recertified annually. In general, the certification process asks that staff members read relevant WHI documents and show they can perform the specific tasks according to predefined guidelines. Recertification ensures that their knowledge and skills are kept current.

This section describes:

- Training and certification resource materials available,
- Training requirements, and
- Procedures for documenting certification and recertification.

3.1 Resource Materials

The CCC has developed various training and certification materials for CC-specific procedures. To address the differences in CC staffing patterns and responsibilities, the training materials are primarily task-specific, rather than job description specific. Copies of the materials are included in the appendices of this manual and in the electronic files (see *Sec. 2.3 - Electronic Files*).

- **Certification Forms**: These forms list required and/or recommended steps in the training process for each specific task (see *Appendix B - Certification Forms*). The Certification Forms are designed to be used for both initial certification and annual recertification, with a new form completed for each annual recertification. Dashes to the left of the activities indicate which activities need to be completed for initial annual certification, and provide a place to mark those activities completed. All the certification forms list WHI Manual reading and review requirements. In general, staff are required to read the listed manual sections for initial certification, and to review the same section as a reminder of the current procedures and to note any changes for annual recertification.

  A General Certification Form (*Form 400*) lists the general reading requirements for all CC staff, including the protocol and manual sections providing a general WHI description. Specific lead staff certification forms have been developed that summarize all tasks that fall under each of the lead staff positions. See *Table 3.1 - Training and Certification Resource Materials* for specific activities for each lead staff group. Also refer to *Vol. 2, Section 2.4 - Staffing* for a description of the general responsibilities for each lead staff group

- **Training/Quality Assurance (QA) Checklists**: Training/QA Checklists contain step-by-step procedures for performing specific tasks (see *Appendix C - Training/Quality Assurance Checklists*). Each checklist includes columns to indicate if the listed task was observed and to record comments. The forms were designed to be completed by an observer while the staff person being evaluated performs the specific task. The Training/QA Checklists are used during:
  - Training, certification, and recertification,
  - Peer observations for routine monitoring, and
  - QA visits to the CCs, with the completed checklists becoming a part of the QA Visit Report.

Note that there is a corresponding training/QA checklist for each certification form; however, there are no training/QA checklists for the lead staff certification forms. Instead, the checklists lead staff are required to complete are incorporated into the lead staff certification forms. Note also that there are additional training/QA checklists for tasks which do not require certification, but which can assist in training. These additional checklists are included on the appropriate lead staff certification forms.

- **Videos**: Standard VHS videotapes supplement training in specific areas, such as endometrial aspirations or ECGs. Contact the CCC Training Coordinator about training tapes that are currently available.
- **Nutrition Training Modules:** Training Modules are available for selected DM activities. Included are 9 modules for use in training Group Nutritionist and Dietary Assessment staff. Each module includes performance objectives, a list of materials, training activities, and a suggested timeframe. Group Nutritionists and Dietary Assessment (DA) staff must be trained by the Lead Nutritionist who has been centrally trained and certified by the CCC. If a CC has a split Lead Nutritionist position, the Lead DM Interventionist must train and certify Group Nutritionist staff and the Lead DA Nutritionist must train and certify DA staff. The modules and related materials are included in the set of electronic files. See *Section 2.3 - Electronic Files*.
- **Training Outlines**: Outlines used for conducting lead staff training sessions are available in the set of electronic files. See *Section 2.3 - Electronic Files* for a list and copy of those available.

Table 3.1 - Training and Certification Resource Materials lists the training and certification materials available. For each listed CC activity, the table shows the Certification Form and Training/QA Checklist

numbers. All Certification Forms and Training/QA Checklists have been renumbered, with Certification Forms numbered 400-499 and all Training/QA Checklists numbered 500-599. Where possible, the Certification and Training/QA Checklist form numbers use the same last two digits. For example, the Certification Form number for ECG is 441 and the corresponding Training/QA Checklist is numbered 541. The table also lists the previous Certification and Checklist numbers for reference. Other sections of the WHI Manuals referring to these forms will be updated as part of normal manual updates.

The table lists the activities in following categories: Lead Staff positions, Consent and Participation Status, Clinical, Nutrition, Outcomes, Data Management and Clinic Operations. For each activity, the table gives the following information:

- Clinical Center Activity: Name of activity requiring certification or for which a Training/QA checklist is available.
- Certification Form Number: A Certification Form number is listed for only those activities requiring certification. Staff do not need to be certified for the listed activities that do not have a corresponding Certification Form number.
- Training/QA Checklist Number: Number of the corresponding checklist.
- WHI Form Numbers: Indicates the WHI forms covered in the Certification Forms and Training/QA Checklists.
- Lead Staff Training Responsibilities: Columns for the lead staff groups indicate the activities covered in the lead staff training's. Lead staff are responsible for the initial training, certification and recertification of non-lead staff on the indicated activities.

Table 3-1
Training and Certification Resource Materials

CC Activities	Certification Form #	Old #	Train/QA Checklist #	Old #	WHI Form # (WHILMA Task #)	Lead Staff Training Responsibilities						
						CM	RC	LP	LN		DC	OCS
									DM	DA		
General Certification	400	-	-	-		X	X	X	X	X	X	X
Lead Staff Positions												
Clinic Manager (CM)	401	201	-	-		X						
Recruitment Coordinator (RC)	402	202	-	-			X					
Lead Practitioner (LP)	403	209	-					X				
Lead Nutritionist (LN)			-									
Lead DM Interventionist (DM)	404	-		-					X			
Lead Dietary Assessment Nutrit. (DA)	405	-	-	-						X		
Data Coordinator (DC)	406	221	-	-							X	
Outcomes Specialists (OCS)	407	-	-	-								X
Consent and Participant Status												
Initial Consent	411	206	511	301	11	X	X	X				
HRT Consent	411	206	512	302	12	X		X				
DM Consent	413	224	513	339	13				X	X		
OS Consent	411	206	514	351	14	X		X				
CaD Consent	411	206	515	352	15	X		X				
DM/HRT Eligibility and Randomization	416	-	516	348	6,8,(910)(920)	X		X	X	X	X	
CaD Eligibility and Randomization	416	-	517	347	8, 16,(930)	X		X			X	
OS Eligibility and Enrollment	416	-	518	346	8, (940)	X		X			X	
Participation Status and Retention	419	-	519	-	7,22,23,24	X		X	X	X	X	
Clinical												
Study Medication Handling	-	-	530	315		X					X	
Study Medication Dispensing	431	-	531	340				X				
Study Medication Adherence Collection	432		532	341				X				
Data Entry for Study Med Selection and Adherence Collection	433	208	533	349	(950),(951),(955)						X	
HRT and CaD Management and Safety Interview	434	233	534	323	10,17,54			X				
Unblinding	-	-	535	344							X	

	Certification Form #	Old #	Train/QA Checklist	Old #	WHI Form # (WHILMA Task #)	Lead Staff Training Responsibilities						
CC Activities						CM	RC	LP	LN		DC	OCS
									DM	DA		
Lab Review	440	230	540	343	81, 82,83, 85, 92, 100			**X**				
ECG	441	214	541	311	86, 91			**X**				
Breast Exam	442	229	542	309	84, 89			**X**				
Pelvic Exam & Pap Smear	443	228	543	310	81, 92			X				
Endometrial Aspiration	444	227	544	316	82, 83			X				
Blood Drawing, Urine Collection	450	215	550	312	100, 101			X				
Blood and Urine Processing	451	213	551	313	100, 101			X				
Blood and Urine Shipment	-	-	552	314	104	X						
Anthropometric Measurements	453	211	553	307	80			X				
Pulse & Blood Pressure	453	211	554	306	80			X				
Functional Status Measurements	453	211	555	317	90			X				
Nutrition												
DM Intervention (a,b,c)	-	218	560A,B,C	305a, b,c					X			
DM Session Observation	461	219	561	336	63,64,65,70,71,72				X			
DM Eligibility	462	225	562	338	6,11,62				X	X		
DM Post-Randomization Interview	463	226	563	337					X	X		
Dietary Assessment (a,b,c)	-	218A	564A,B,C	328a,						X		
Food Frequency Questionnaire	465	220B	565	330	60, 61					X		
Food Record Instruction	466	220A	566	331	62, 69					X		
Food Record Documentation	466	220A	567	329	62					X		
Outcomes												
Outcomes	470	-	570	354	33,33D, 120s						X	X
Participant Files	-	-	581	332	all	X					X	
Data Management												
Data Entry and Scanning	480	222	580	327	all						X	
Participant Files	-	-	581	332	all	X					X	
Participant File Audit (Off Site)	-	-	582	326		X					X	
Participant File Audit (On Site)	-	-	583	333		X					X	

						CM	RC	LP	LN		DC	OCS
									DM	DA		
Clinic Operations												
Interviewing and Forms Review	490	205	590	300	2,3,4,20,30,31,32,34,35, 37,38,39,42,43,(44),(45), 48,143,144,145	X	X	X		X	X	X
Screening Visit	-	-	592	318	-	X						
Follow-up Visit	-	-	593	319	-	X						
OS Follow-up	-	-	594	353	-	X						

3.2 CC Staff Training Requirements (Required)

Required training activities are defined for all CC lead and non-lead staff. The CCC conducts central training for all lead staff. Supplemental training sessions may also be offered on regular staff group calls. In addition, national meetings may also include training-like sessions for appropriate CC staff. Some CC lead staff may have responsibilities for more than one staff group area, and therefore need to attend more than one central training session. Trained CC lead staff, in turn, conduct training for non-lead staff.

3.2.1 Initial Lead Staff Training (Required)

Clinical Center lead staff were required to attend initial central training sessions at the time of CC start-up before clinic activities began. Topics covered in the initial training sessions corresponded to the general areas of responsibility for each of the lead staff groups. (See *Vol. 2 - Procedures, Section 2.4 - Staffing.)* The Bone Density Center at UCSF ensures Hologic training of CC staff performing bone densitometry at the three Bone Density CCs.

3.2.2 Replacement Lead Staff Training (Required)

Training sessions for CC replacement lead staff occur at the CCC approximately every six months, if needed. This allows newly hired CC Lead staff to attend central training within six months of hire. Lead staff who are hired after the initial training sessions or who become lead staff during the course of the study must attend the appropriate replacement training sessions. Because the number of staff attending a replacement training session is relatively small, the training sessions are usually completed in 2 to 3 days.

The content and materials covered in replacement sessions are similar to those covered at the initial training sessions, covering all activities that fall within the lead staff group responsibilities. After the training session for some lead staff groups, some additional training activities must take place at the CC for some tasks. The Certification Forms indicate the additional activities needed; these include activities such as observations by a consulting gynecologist of clinical exams, observations of DM Intervention sessions, and completion of practice ECGs.

3.2.3 Non-lead Staff Training (Required)

Clinical Center lead staff are responsible for training non-lead staff on appropriate procedures at the CC. At the discretion of the CC, non-lead staff may attend the CCC lead staff training sessions if the additional staff can be accommodated within the size limitations of the training session.

Clinical Centers are strongly encouraged to send at least one Group Nutritionist with the Lead DM Intervention Nutritionist to lead nutrition staff central training sessions. Any Group Nutritionists who cannot attend the central training sessions must be trained using the standard training and certification materials.

A clinic practitioner who performs clinical exams such as pelvic exams and endometrial aspirations needs to have observations and review by the CC consulting gynecologist.

3.2.4 Physician Adjudicators (Required)

The CCC and the Morbidity and Mortality Committee have developed sessions for a physician training plan in event adjudication for WHI. Physician adjudicators are trained by reading the appropriate sections of *Vol. 8 - Outcomes*, and participating in CCC activities for ensuring standardization of adjudication, for example, review of mock packets, conference calls, and case review meetings at regional CC meetings (see *Vol. 8 - Outcomes* for more details).

3.2.5 Consulting Gynecologists (Required)

Clinical Center PIs designate a consulting gynecologist for their CC. The consulting gynecologists do not participate in a formal training and certification process. Instead, they should review the relevant sections of the WHI Manuals and the Consulting Gynecologist Handbook. The Handbook contains information targeted for the consulting gynecologist, including the consulting gynecologist's role and responsibilities, copies of the pertinent WHI Manual sections, as well as samples of the forms and materials consulting gynecologists may need to fulfill their duties, are found in the handbook.

3.2.6 Conference Calls with Training Focus (Required)

Clinical Coordinating Center staff cover new or revised procedures on routine Regional Staff Group conference calls, as needed. If additional time is needed to cover specific topics or to include specific staff performing the activities, separate conference calls may be scheduled.

3.2.7 Annual General Meetings (Required)

Annual General Meetings are scheduled to occur every year, and the Steering Committee may select a lead staff group to attend, as needed. The meeting agenda is developed to include sessions for the selected lead staff group, based on study phase and training needs. These sessions target:

- Issues and concerns raised during the previous year or anticipated for the next year,
- Study requirements for the upcoming year,
- Adherence and retention issues, and
- Updated information as needed.

Lead staff groups can provide recommendations and rationale for sessions to the CC Staff Committee, which in turn provides the Steering Committee with specific recommendations.

3.3 CC Staff Certification (Required)

Certification is the process of documenting that a CC staff person has received adequate training and can perform a task consistent with study-wide criteria. Clinical Centers are responsible for ensuring all CC staff are appropriately certified for the WHI tasks they perform and that CC staff are recertified annually for these tasks. The CCC is responsible for reviewing the certification documentation at routine QA Visits.

To document the certification or recertification, a CC staff person must:

- Complete the required reading in the General Certification Form.
- Complete the required reading listed on the specific Certification Form. This includes review and reading of relevant task-specific sections in the WHI Manuals, relevant forms and/or use of WHILMA, as needed.
- Read relevant Bulletins. Staff need to read relevant Bulletins to ensure they are informed of most up-to-date procedures and policies. A table listing the relevant Bulletins is included in the Public Folders (see *Section. 2.3 – Public Folders* for description and information on access to the Public Folders). The table includes the certification task number and the references to pertinent parts of related Bulletins released in the past year.
- Observe and practice the specific task, guided by the corresponding Training/QA Checklist. Ideally, lead staff complete certifications and checklists on non-lead staff. Certified non-lead staff may complete the Training/QA Checklists on other staff if lead staff are not available to perform these observations. In addition, staff members may complete the checklists by themselves if other staff are not available to make the observations. However, observations by lead staff is strongly encouraged, particularly in those activities that involve interactions with participants.
- Complete other required activities listed on the appropriate Certification Form. Activities required for certification and recertification can differ. For example, initial certification may require training activities that are not required for recertification. Each Certification Form indicates which activities need to be completed for initial certification and those to be completed for recertification.
- Complete the appropriate Certification Forms (General and lead staff/task-specific).

To help track staff certification, use a tracking form such as the form shown in *Table 3.2 - Model Certification Tracking Form*. For each task a staff member performs, record the following: initial certification date, due date(s) for annual recertification, and annual recertification completion date(s). The CCC will review the certification records during routine QA Visits.

3.3.1 Initial Certification (Required)

Lead Staff

Lead Staff must attend the CCC initial or replacement staff training sessions and complete activities listed on the lead staff Certification Forms to be initially certified. Considerations for lead staff initial certification include:

- Clinical Center lead staff who have not attended initial training must come to replacement staff training to be initially certified.
- If Clinical Center lead staff complete only part of the required activities at initial/replacement lead staff training, the remaining activities must be completed at the CC before lead staff can be certified. The certification forms indicate which activities must be completed.
- CC lead staff who have more than one area of responsibility (e.g., Clinic Manager and Recruitment Coordinator) must meet the required certification conditions for each area.

- WHI Clinic Practitioner certification for physicians, nurse practitioners, physician assistants, and registered nurses requires that they be appropriately licensed according to local, state, and federal regulations. Clinic Practitioners planning to perform pelvic exams, pap smears, endometrial aspirations, clinical breast exams, or breast self-exam instruction can perform only those procedures legally within the clinical scope of their licensed practice.
- Replacement lead staff or current lead staff who change responsibilities must meet lead staff or task-specific training requirements before they can be certified for their new responsibilities.

Non-Lead Staff

Non-lead staff who have contact with participants, complete data collection forms, or perform specific tasks must be certified. This can be done at the CC by appropriate centrally trained lead staff or by other certified non-lead staff. Non-Lead staff are initially certified after completing the activities listed on the appropriate Certification Forms.

3.3.2 Recertification (Required)

Recertification (renewal of certification) is necessary to ensure ongoing standardization of protocols and procedures in the WHI. In general, staff can be recertified after completing activities for recertification listed on the appropriate Certification Forms.

Considerations for lead staff:

- Lead staff must be recertified in all areas covered by their lead staff responsibilities , even though they may not perform the specific activities at the CC. This will enable the lead staff to certify and recertify non-lead staff.
- In addition to annual recertification, Lead DM Intervention Nutritionists must maintain familiarity with the Dietary Modification (DM) Intervention session materials and experience with DM Intervention group skills. This expertise and experience is necessary to assure appropriate training and QA monitoring of CC Group Nutritionists. Recertification of Lead DM Intervention Nutritionists require that they:
  - Facilitate all the sessions of the **first** DM Intervention group begun at the CC.
  - Facilitate at least two ongoing DM Intervention groups. To increase flexibility and accommodate varying levels of availability, the DM Intervention Nutritionist can delay adding a second group until this first group has reached a monthly session schedule. This delay would spread out the intensity of the work required for group facilitation.
- Ideally, lead staff complete the training on QA checklists for non-lead staff. However, peer observations can be substituted for some observations. See *Section 3.3.1 – Initial Certification* above for more information. If there is no lead staff person who has been centrally trained to certify/recertify new non-lead CC staff, non-lead staff must still complete as much of the certification process as possible (example: CC is waiting to fill a lead staff position or replacement training won't occur for several months after a new lead staff person is hired). See *Section 3.3 – CC Staff Certification* for a list of activities to be completed. Observations by a centrally trained lead are not needed for several of the required tasks on this list (i.e., reading certification forms, manual sections, and relevant bulletins).

Considerations for non-lead Staff:

- Staff documenting *Form 62 - 4DFRs* must satisfactorily complete quarterly 4DFR exercises. The exercises are designed to enhance proficiency in documentation of the 4DFRs. The CCC develops the quarterly exercises based on recent study wide 4DFR Inquiries and distributes them to all Lead Dietary Assessment (DA) Nutritionists quarterly. The Lead DA nutritionist:
  - Copies the exercises and distributes them to appropriate staff to complete;

- Reviews and discusses the completed exercise with staff using the answer key and discussion guidelines provided with the exercise; and
- Documents the date of the discussion and files the completed exercises in a QA notebook for review at the next QA Visit.

3.3.3 CC Strategies for Certification/Recertification

The following strategies for certifying and/or recertifying staff arose from discussion on a series of routine Clinic Manager and Clinic Practitioner conference calls. The strategies listed below may assist CC staff in training lead and non-lead staff in an efficient and timely manner.

1. Use a group certification method so that multiple staff can be certified at the same time. For example, if specific bulletin changes need to be reviewed, this can be done in a group setting where questions, answers, and changes can be addressed.
2. Certify standard procedures in a group setting with mock scenarios for observations. This can accomplish several goals: certifies for multiple tasks (i.e., blood pressure and waist measurements), creates an opportunity for different scenarios to be presented and problem management to take place, and allows the staff to see the different perspectives that involve other staff members.
3. Have various staff members actually conduct a presentation to the rest of the staff on their responsibilities and their role in WHI. This presentation could cover materials that needed to be read and reviewed. This can encourage staff to work on their public speaking skills as well as give the entire staff an idea of what they do for WHI.
4. An alternative to the group certification method is to develop a checklist (with names of staff on the checklist) to list all reading material so appropriate staff could check it off next to their name after they have read anything that was distributed from the CCC.
5. Have staff check off all protocol changes in the bulletin as they are read. Another option is to review with appropriate staff a piece of the protocol monthly.
6. Provide an individual sign-off sheet for each procedural change that is implemented. A signature of a staff person would indicate she/he has read, been instructed, and if appropriate, was observed doing a new task and is responsible for seeing that it is implemented.
7. Create individual packets for each staff member that contain their respective checklists and reading materials. The packet is assembled and given to each staff person. When the staff person has completed the reading materials in the packet, she is expected to contact the certifier for observation of the task being done.
8. Have the most appropriate certified staff person recertify CC staff in specific tasks.
9. Use the month of December to certify/recertify CC staff as December is generally a slow month for scheduling participants.
10. Close down your CC for 1-2 days during the month of December, if possible for your CC, to certify/recertify.
11. Associate certification/recertification with annual performance evaluation so the two tasks are not separated.

Table 3.2
Model Certification Tracking Form

Staff Name ID						
Certification Form #	Task Name	Date of initial certification	Date recertification due	Date recertification completed	Date recertification due	Date recertification completed
		4-20-94	4-95	6-95	4-96	6-96
			4-96		4-96	

Section 3
Training and Certification

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SECTION 4
OBSERVATIONS

INTRODUCTION

Observations of staff performing activities ensures staff received adequate training and perform tasks using approved and/or standardized procedures. Observations help identify procedures that are not clearly understood and/or need improvement as well as identify where additional training is needed. In the same way, monitoring the performance and condition of equipment helps identify the need for equipment maintenance and/or additional training on the appropriate use of the equipment.

Clinical Center (CC) lead staff, certified peers, and Clinical Coordinating Center (CCC) Quality Assurance (QA) staff are all responsible for observing routine activities using the standard Training/QA Checklists. Observations by CC lead staff and certified peers occur during initial local training, recertification, and routine quality assurance monitoring. The CCC observations occur during initial central training and at the initial and regular follow-up QA visits.

This section describes:

- Clinical Center responsibilities for observations,
- Clinical Center responsibilities for equipment monitoring, and
- Clinical Coordinating Center QA Visits.

4.1 CC Observations

Clinical Center lead staff are responsible for observing non-lead staff performing procedures. Observations by peers or other staff members also helps promote discussion of the procedures and consistency in performing the activities.

4.1.1 Observations for Certification

Clinical Centers must use the Training/QA Checklists for initial certification and annual recertification observations. Ideally, lead staff complete the Training/QA Checklists on non-lead staff. However, lead staff may choose other appropriate certified staff to do the observations. In addition, staff members may complete the checklists themselves if other staff are not available to make the observations. Observations by other lead staff are strongly encouraged, particularly in those activities than involve interactions with participants.

After the observation, the lead staff or peer observer and staff observed should meet to identify strengths as well as areas needing improvement. If areas of improvement are major, lead staff should outline an individualized plan for correction. The lead staff monitor the implementation of the plan as dictated by the degree of improvement needed. For example, the lead staff may choose to follow-up only verbally if areas needing improvement are minor. On the other hand, the lead staff may observe the task a second time if the areas needing improvement are significant.

4.1.2 Observations for Quality Assurance

In addition to the initial certification and recertification observations, some tasks have more frequent observation requirements as noted on the Training/QA Checklist. Perform the observations according to the schedule on the Checklists.

On a quarterly basis, the Lead (DA) Nutritionist must observe and evaluate staff who do not meet the Four-Day Food Record (*4DFR*) documentation performance standards using *Form 567 - Food Record Documentation.* See *Vol. 2, Section 10.1.8 - QA of 4DFRs for more details*.

4.2 Equipment Checks

Equipment checks and routine maintenance help identify both short-term and long-term problems with equipment performance. Each CC is responsible for the appropriate functioning and maintenance of equipment used to carry out WHI procedures. Clinical Centers need to maintain logs of equipment checks and maintenance following both the manufacturer and WHI requirements. *Table 4.1 - CC Equipment Maintenance* lists the type and frequency of the required equipment checks

It also strongly recommended that CCs keep a maintenance log for other equipment in the CC, including the Personal Computers (PCs), scan guns and pens, and scanner. See *Vol. 5, Section 10 - Maintenance and Support*.

Table 4.1
CC Equipment Maintenance

Equipment Description (Vol. 2 - Procedures references)	Check	Each Use	Daily	Monthly	Semi-Annually	Annually
Blood Pressure Cuffs; 4 sizes available (See *Sec. 2.3.2.3* and *9.2.5*)	Inspect for wear and tear.	X				
Sphygmomanometer; conventional mercury (See *Sec. 2.3.2.3* and *9.2.5*)	Check for zero reading before measurement.	X				
	Local inspection and cleaning; inspect cap.					X
Stadiometer; Recommend: Perspective Enterprises, model #PE-WM-60-84-PL (See *Sec. 2.3.2.3 and 9.3.3*) Alternative equipment models must be approved by CCC (calibration requirements may vary).	Check ease of movement, pressure of head piece, measuring board for accuracy.					X
Stadiometer; Harpenden at Bone Density sites (See *Sec. 2.3.2.3* and *9.3.3*)	Calibrate.		X			
Scale reading in kgs; Recommend Detecto Balance Beam (See *Sec. 2.3.2.3 and 9.4.4*)	Balance to zero before each participant steps on scale.	X				
	Calibrate with two 25 kg or one 50 kg wt (semi-annually & when moved).				X	
	Certify by independent scale technician.					X
Scale that is not a balance beam	Calibrate weekly and when moved.	X				X
Measuring Tapes; supplied by CCC (See *Sec. 9.5.4*)	Visually inspect for wear and tear.			X		
Hand Grip Dynamometer; Jamar-hydraulic (See *Sec. 2.3.2.3* and *9.6.3.3*)	Check for correct zero.	X				
	Check posts, hydraulics, handle, and peakhold, needle; calibrate with weights.				X	
	Certify by manufacturer.					As needed
Freezer (-70º C) (See *Sec. 11.3.5.1*)	Monitor temperature.		X			
	Check alarm and back-up system, e.g., CO_2 tank, temp recorder (if present) with certified thermometer.			X		
	Defrost as needed; inspection by service representative.					X
Refrigerated Centrifuge with Swinging Buckets (See *Sec. 11.3.5.1*)	Monitor temp. 0º to 10º C range with certified thermometer.			X		
	Check speed with tachometer.					X
ECG; MACPC (See *Sec. 13.5.2*)	Drain battery.			X		
Bone Densitometer (BD sites only)	See *Vol. 6, Section 7 - Monitoring Machine Performance* for specifications.		X			
OHAUS Pill Weighing Scale (CT1200) (See *Sec. 15.6.2.2*)	Calibrate with 500 gm and 1,000 gm weights and do span check.		X			
	Do linearity check (and as needed when moved, dropped).			X		
Timed Walk (See *Sec. 9.6.5*)	Check for correct measurement of 6 meters (and when moved).					X

4.3 QA Visits by CCC

Clinical Coordinating Center QA staff conduct routine QA visits to each Women's Health Initiative (WHI) CC starting in the first year of operation. The QA Visit offers an opportunity for the CCC QA staff to learn more about the CCs, share information with CC staff, observe the individual functioning of a CC, and provide feedback.

A minimum of one three-day visit to each CC will be conducted within the first year of CC operations. In subsequent years, a two-day visit will be conducted. The frequency of QA visits is one every two years after Year 1 for those CCs with good or excellent performance as assessed at the most recent QA visit and subsequent performance indicators. In general, a team of two CCC QA staff members, one clinical and one nutritional, conduct QA Visits to each CC. Occasionally a CCC Data Coordinator or other QA staff member will accompany the regular CCC QA staff.

For CCs with satellite sites, a QA visit usually includes a visit to both the primary and satellite CC sites, and the visits may be extended to allow enough time for observations at both sites. The amount of time spent at the satellite site depends on the operations performed at each site and how far the satellite site is from the primary CC. QA visitors may also observe operations conducted at remote sites where the CC conducts visits with participants but has no access to WHILMA.

4.3.1 Preparation for QA Visits

Preparations for the visit includes:

- Setting the dates for the visit.

  Timing, dates, and proposed agendas for routine annual visits are based on CC performance on the initial QA visit, date of the most recent visit, and availability of staff. The dates and agenda items for the QA visits come from a collaborative effort between the CCC and CC that begins approximately two months before the visit. Initial QA visits are scheduled after the first DM Intervention group at the CC completes at least Session 3. Dates depend on the availability of appropriate CC and CCC QA staff.

  Once dates have been negotiated, the CCC QA staff send the Clinic Manager a proposed list of observations and meetings with lead staff (and discussion guidelines for meeting with lead staff). The Clinic Manager creates an agenda to accommodate the CC schedule. After the agenda is finalized, the CCC QA staff send a copy of the final agenda to the Clinic Manager.

- Completion of selected Training/QA Checklists (DM).

  The Lead Nutritionist sends copies of the most recently completed *Form 560 - DM Intervention and Form 564 - Dietary Assessment* to the CCC before the visit. The CCC nutritional QA visitors use the completed checklists as a guide for discussion during the visit.

- Submission of participant files to the CCC for the off-site participant file audit.

4.3.2 Content

Quality Assurance visits include a variety of activities, including meetings with lead staff, review of reports, observations using the Training/QA Checklists, and training sessions as appropriate. There may be additional topics added to the agenda based on CC performance issues that require observation or discussion. The additional topics may originate from the CCC or the CC. The CCC may request to meet with specific staff in addition to the lead staff to review activities and provide feedback. The CC staff may request that certain topics be reviewed based on staff members' own observations.

Standard QA visit agenda items include:

- Staff introductions and tour of facility.
- Meetings with lead staff: Meetings are held separately with each of the lead staff (Clinic Manager, Recruitment Coordinator, Clinic Practitioner, Lead Nutritionist, Data Coordinator, and Outcomes Specialist to discuss specific CC issues related to the staff position, including local QA operations and reports. Outlines of the topics discussed during the meetings are distributed before each visit. (See current copies of the discussion guidelines located in the Public Folders of Outlook. Refer to *Section 2.3 Public Folders* for more information.) Other topics are covered based on CC need and request.
    - Review of activity reports with appropriate staff: This includes review of routine CCC monthly activity and subcontractor reports as well as reports the CC can generate in WHILMA, with a focus on areas in which the CC may need assistance.
    - Review of local QA program: This includes review of certification and recertification records, equipment logs, and other local QA activities.
- Observation of clinical operations, dietary modification intervention, dietary assessment, and data management operations, as appropriate: The observations focus on activities that fall under the higher priority levels (see *Section 1.2 - Priorities*). A higher priority may be given to those areas in which the CC requests or needs special attention, and a lower priority may be given to those areas showing good performance at previous QA visits and/or on data monitoring reports.
- Participant file audit. (See description below.)
- Debriefing: The QA staff conduct a debriefing at the end of the visit with the PI, lead staff, and other CC staff, at the CC's discretion, to review and discuss the findings from the observations and meetings. The QA Visitors will hold a separate debriefing with the Clinic Manager and/or PI, if requested, and as time permits. The QA visit report includes items discussed at the debriefing and may include additional items identified after review and discussion at the CCC.

Additional or supplemental training is included as needed: A CC may request CCC QA staff to conduct on-site training sessions by proposing it in the first draft of the QA visit agenda. The appropriate CCC Unit Manager will review the request and determine the feasibility and appropriateness of conducting a training session during the QA visit. If the requested training is not feasible, the QA staff will recommend alternate ways for the CC staff to obtain the training based on the complexity of the activity, availability of expertise for the specified activity, and availability of time and space. Clinical procedure training (e.g., some aspects of ECG, pelvic exam Pap, endometrial aspiration, breast exam, blood draw) is not available on a QA visit. Training done during a QA visit does not replace central training for lead staff.

4.3.3 Participant File Audit Content

The CCC performs a file audit of selected participant files to evaluate the quality of CC data collection and documentation. Files may be reviewed on-site during the QA visit and some may be selected for copying and review at the CCC by clinical, nutritional, and data staff. Additional file audits may also be conducted at other times locally or by the CCC. In general, files are selected at random, although files may also be selected based on particular problem areas. Action items identified in both the on-site and off-site participant file audit are included in the final QA Visit report. See Table 4.2 for list of file audit codes that classify file audit discrepancies into action items. Each file audit is documented using a file audit form (see Figure 4.1)

4.3.3.1 On-Site File Audit

One or more participant files may be reviewed on site during the QA visit. This audit usually includes at least one HRT and one DM participant file with an annual follow-up visit (identified by WHILMA report). Only the contacts for the previous year are reviewed.

During the on-site file audit, the reviewers look for the following:

- Each form is labeled with the participant name and ID number
- Correct name and date on each lab result
- Correct editing procedures.
- Appropriately filed forms
- Copies of lab, pathology, and mammogram reports attached to appropriate WHI forms
- Ink used on non-mark-sense forms
- No outcomes documents (e.g., *Form 120-131*) or other information about outcomes adjudication included in regular participant file
- Hormone Replacement Therapy (HRT) and DM Intervention-specific information separated from routine WHI forms (separated in chart or in a different physical location)
- Forms are used appropriately (used when needed and completed appropriately):
    - question responses clearly marked,
    - results from lab or clinical procedures recorded correctly,
    - edits made appropriately
    - duplicate forms are not completed
- Forms found in the file have been data entered, as needed, and forms are not data entered more than once.
- All forms data entered are filed in the participant file.
- Forms are filed in the correct participant file.
- Other issues or problems as needed.

4.3.3.2 Off-Site File Audit

The CCC requests participant files for the off-site file audit approximately one to two months before the QA visit. This lead time gives the CCC time to complete the audit before the visit and allows the QA visitors to give the CC feedback on the audit during the QA Visit. The CCC sends the CC a list of the participant ID numbers selected for the off-site file audit. In general, the CCC identifies 10 participants for the audit, using the following criteria:

- Participants screened and randomized or enrolled within the last 12 months
- Participants with follow-up contacts within the previous 12 months, including one with an annual visit and with an emphasis on DM and HRT participants.

Once recruitment is completed, all participant files will be selected from those with contacts within the last 12 months. Additional criteria may be added as needed.

Upon receipt of the participant ID numbers for the off-site file audit, the CC copies the chart for each participant and sends the copies to the CCC within one day. The forms and time period of forms to be copied may change, depending on the issues to be addressed in the audit. The initial notice to the CC about the file audit will include the specifics of which parts of the file to copy for the CCC.

Specified items reviewed in the off-site file audit that are not included in the on-site audit include the following items:

- Correct interpretation and recording of results on the appropriate form, specifically,
  - *Form 82 – Endometrial Aspiration*
  - *Form 83 – Transvaginal Uterine Ultrasound*
  - *Form 85 – Mammogram*
  - *Form 86 – ECG*
  - *Form 89 – Breast Follow-up, as needed*
  - *Form 92 - Pap Smear*
- Clinical contact notes are present and used to enhance communication and ensure participant safety
- Presence of DM Progress Notes on regular basis, (e.g., after every other session, after Individual Session), and with enough information to give the reader some knowledge of the participant
- System for tracking DM Intervention participants through use of Member Task Status Report (*WHIP165*)
- Completion of all expected tasks using Group Session Schedule (*WHIP0431*)
- Use of current version of the forms

Table 4.2

Codes for Standard Action Items

Code	Description
1	Question on form is blank while corresponding question in WHILMA has a response (this includes no participant ID on a form).
2	Question response in WHILMA does not match corresponding question response marked on the form, or question response in WHILMA is blank while corresponding question response is marked on the form.
3	Edits to items on the forms are incompletely documented, missing staff initials and/or date.
4	An item on a clinic-administered form requiring a response is not answered.
5	A form found in the participant file has not been data entered.
6	A form entered into WHILMA was not found in the participant file or in the copy of the participant file.
7	The contact date on *Form 11 (12, 13, 14, 15)* does not match the date the participant signed the corresponding consent form.
8	Questions on a form were not marked correctly or results from lab or clinical procedures were not recorded correctly onto the corresponding form.
9	A duplicate form was completed and entered into WHILMA for the same task.
10	Forms or other participant materials for a different participant were found in the file or copy of participant file.
11	Clinic-administered form was completed in pencil rather than pen.
R	Other required action item.

Figure 4.1
Chart Audit Form

CC:_____

ID: __ __ - __ __ __ __ __ - __ HRT___ DM___ Randomized Date: _ _ - _ _ - _ _ On-Site ___ Reviewer: _____

CaD ___ Randomized Date: _ _ - _ _ - _ _ Off-Site ___ Reviewers: Clinical____ Nutrition____ Data_____

Form #	Form Date	Full Audit	Partial Audit	Clinical/ DM	Qx # - description	Form response – description	WHILMA data – description	Comments	Code

4.3.4 Documentation of QA Visit

4.3.4.1 QA Visit Report

The CCC QA staff prepare a written report of the findings from the QA visit, and sends the report to the CC and the WHI Project office within one month after completing the visit. The report includes the following sections:

- Introduction: The dates of the QA visit, a list of QA staff conducting the visit, the general purpose of the visit, observations or topics added to the standard agenda based on clinic performance, and an outline of the report format.
- Summary: A brief description of the CC's overall performance.
- Summary Table: A list of QA checklists indicating those that were completed for the QA visit and those that resulted in action items.
- Action Items: A list of the required and recommended action items for the CC and a list of action items for the CCC generated from the QA visit. This includes a list of all the findings of the on and off-site file audit.
- QA Checklists: All QA Checklists completed during the visit and for the off-site participant file audit. These completed Checklists form a detailed explanation of the required and recommended action items.
- Lead Staff Discussion Guidelines: Notes taken during meetings with lead staff
- Other Related Materials: Includes CC-specific materials such as CC organizational chart, clinic flow, clinic procedures, or participant materials.
- Copy of QA visit agenda.
- Copy of Chart Audit forms.

Required CC action items are indicated as such in the WHI Manuals and immediate implementation is required. Recommended CC action items are suggestions to improve the efficiency and consistency of the CC and can be implemented at the CC's discretion.

4.3.4.2 CC Response and Final Report (Required)

The CC is required to provide a written response to the QA Visit. The CC response is due at the CCC within two weeks of receipt of the report. The CCC forwards the report to the WHI Project Office

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Section 4

Observations

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Section 5

DATA MONITORING

INTRODUCTION

Monitoring data is done by both the Clinical Coordinating Center (CCC) and Clinical Centers (CCs) to monitor CC performance on a wide variety of activities from meeting goals in recruitment, adherence and retention to appraising the quality of data collected. The primary method used to monitor data quality is the production and review of general and specific reports. The type, frequency, and detail of these monitoring reports and other activities is largely dictated by the priorities as outlined in *Section 1.1 - QA Focus and Priorities*, with more attention given to items with higher priority.

Due to the size and complexity of the Women's Health Initiative (WHI), monitoring the quality of WHI study data can generate a large number of reports. Both the CCC and CCs can generate a variety of reports to monitor individual performance and to help identify issues and procedures that need review. The frequency of generating the reports is determined by balancing the CC's need for prompt and frequent monitoring with the available resources to produce such reports.

This section includes:

- A summary of CCC and CC activities to monitor:
  - Study progress in recruitment, adherence, and retention
  - Completeness of WHI specified tasks and associated data collection
  - Validity, or accuracy, of the data collected
  - Timeliness of data collection
  - Reliability of data collection
- A schedule of reports to be run at the CCs

5.1 Database Reports

To provide prompt feedback, CCs have the ability to produce many specific monitoring reports from their own database. Using these CC-produced reports, CCs can evaluate many aspects of their operations, compare their performance to study wide goals (as shown in *Section 6.1 - Performance Goals)*, identify issues and procedures that need review, and monitor individual staff performance. The reports also allow the CCs to take corrective action without needing to wait for monthly reports from the CCC. *Vol. 5 - Data System, Appendix D - WHILMA Reports* provides a list of reports CCs can run, giving the report name and number and a description of the report. The report menus in WHILMA are organized by report topic and provide a complete list of reports available at the CCs.

On a regular basis, the CCC prepares the monitoring reports described below from the quarterly consolidated database. These reports show quarterly and cumulative data by CC, allowing comparisons among CCs. The CCC distributes these reports to the Project Office, Contract Office, CC Principal Investigators (PIs), and CCC subcontractors (see *Table 5.1 -Distribution of Routine CCC Reports*). Using the CCC reports, CCs can compare their performance to that of other CCs. Clinical Centers with good performance are encouraged to share their strategies for achieving this with other CCs on their routine staff group conference calls. Clinical Centers performing below the performance goals are encouraged to discuss strategies for improving their performance with other CCs and with the CCC.

Appendix D - CC and CCC Reports includes all the reports available to the CCs in WHILMA and from the CCC (as of March 1997). Included is a list of routine CCC activity reports and a list of CCC subcontractor reports. Both lists give the report number, name, and a short description of intended use. A third list combining all WHILMA reports and CCC reports is included, sorted by WHIP number and by topic. The PMC report is also included in the listing when the PMC report is the only current source for the data. This list is also available in electronic format (see *Section 2.3 Electronic Files*).

5.1.1 Quarterly Activity Reports

The CCC prepares a set of quarterly reports showing data for activities such as, follow-up, adherence and retention, and outcomes. The reports are prepared from the quarterly consolidated database and show quarterly and cumulative data by CC, allowing comparisons between CCs.

Examples of currently distributed quarterly reports include:

- DM Intervention performance
- Retention and follow-up status for all components
- Outcomes processing
- Subcontractor data including ECG, blood and urine collection and processing, and bone densitometry collection and processing

Quarterly consolidation of CC data occurs at the end of February, May, August, and November. The CCC runs and distributes the reports in the weekly mailings to the CCs as soon as they are available, generally 3-6 weeks after consolidations.

The set of reports included each quarter changes as the study proceeds, with new reports added as new stages in the study occur, and other reports are dropped as activities stop (e.g., recruitment). The production of selected reports may be reduced to a semi-annual basis as activities stabilize and require less frequent monitoring. See *Appendix D.1 – CCC Routine Activity Reports* and *D.2 – CCC Subcontractor Reports* for a list of reports as of June 1998.

5.1.2 Performance Monitoring Committee (PMC) Quarterly Report Packet:

The CCC prepares the PMC Summary Report packet each quarter, with the schedule corresponding to the DSMB and Annual Progress report schedule (*Section 5.1.3 – Data and Safety Monitoring Board [DSMB] Report*). The CCC and PMC use the report to monitor CC performance. The tables in the report summarize some data from the quarterly activity reports as well as provide additional data on adherence. Footnotes on each table indicate the routine reports used to create the summary tables. Topics covered in the report are:

- DM C-I
- HRT and CaD pill collection, adherence and retention
- OS Year 3 Visit Completeness
- Outcomes processing
- Task completeness for all required tasks

Within each table, the performance of each clinic is detailed for key activities related to the listed category. Tables also includes a percent of goal over a previous time period to allow easy monitoring of trends within each clinic.

The CCC distributes a hard copy of the PMC report to the Project Office, the PMC, and CC Principal Investigators (PIs) and Clinic Managers. The report is included in the semi-annual DSMB report, the Annual Progress Report, and in Public Folders.

5.1.3 Data and Safety Monitoring Board (DSMB) Report

The CCC produces the DSMB Report every six months from the August 31st and Feb. 28th consolidated databases. It includes all the information in the Annual Progress Report and also displays data by treatment assignment. As a result, it is a confidential report that the CCC distributes only to the DSMB. The DSMB uses this report to monitor study progress and make decisions about continuing or stopping the study.

5.1.4 Semi-Annual Progress Report

The CCC produces a Semi-Annual Progress Report from the consolidated database on February 28th and August 31st. The report summarizes study progress in all areas to date, including details of enrollment; participant baseline characteristics; follow-up and retention; HRT, DM, and CaD interventions; outcomes; and clinic performance monitoring. Many of the reports included in the Annual Progress Report are the same as the quarterly activity reports and other reports the CCC routinely circulates to the CCs.

5.1.5 Periodic Monitoring

The CCC monitors various activities on a periodic basis and provides reports of these activities to the Steering Committee for review. These include:

- Outcome event rates: The CCC plans to provide comparisons of outcome event rates to external sources of event reports (e.g., HCFA, NDI, SEER registry tapes).

Table 5.1
Distribution of Routine CCC Reports

Reports	Project Office	DSMB	CC PIs	CM	Lead Staff	CCC Subcon-tractors*	Frequency	Distributed as
Activity Reports	X		X	X		X	quarterly	hard copy or electronic copy (if available)
PMC Summary Report	X		X	X	X		quarterly	hard copy and electronic copy
DSMB Report	X	X					twice per year	hard copy
Semi-Annual Report	X	X	X			X	Twice per year	hard copy

* CCC Subcontractors include EPICARE (for ECGs), McKesson BioServices (for blood and urine aliquots and all study medications), Bone Density Center at UCSF, Univ. of Minn., and Univ. of Washington.

5.2 Completeness of Data Collection

Monitoring completeness of data collection is done on two levels:

- Monitoring that contacts and specific tasks are completed at designated times
- Monitoring missing data associated with specific tasks

Table 5.2 - A. CC Schedule for Data Monitoring - Required summarizes the schedule and data monitoring activities CCs are required to perform. The table lists the activity, report number, action to take, and the frequency of the activity. Clinical Centers may perform the activity more frequently. *Table 5.2 - B. CC Schedule for Data Monitoring - Recommended* gives a schedule for running and reviewing other recommended CC reports.

5.2.1 Conducting Tasks at Designated Times

Clinical Centers (CCs) are responsible for ensuring they conduct contacts with participants at specified times. Due to the complexity and size of WHI and to conserve study resources, some tasks are performed at a limited number of visits and/or on a subsample of participants. (See *Vol. 1, Appendix A.1-1 - Participant Contact Schedule* for the schedule of routine contacts and tasks.) While the schedule of contacts reduces the overall data collection burden, it increases the complexity of data collection at the CCs and increases the importance of careful tracking by CCs.

To facilitate the scheduling of appropriate contacts and tasks, WHILMA provides various task reminder and completeness reports. *Section 6.1 - Performance* Goals gives specific goals for completion of both CT and OS contacts.

5.2.1.1 Task Reminders

Task reminder reports list participants due to complete a specific task within a date range and/or for a specific visit and year, including reports listing participants selected to be in different subsamples. A Visit Plan report lists tasks to be completed for a specific participant at a specific visit. Clinical Centers are encouraged to run and use the reports on a regular basis to help ensure contacts are made as needed, and to perform the appropriate tasks at the contacts.

5.2.1.2 Task Completeness

To help identify tasks that have not been completed when due, reports for overdue contacts are available for many different contacts and tasks. Clinical Centers are encouraged to run these reports on a regular basis to identify tasks that still need to be completed.

Note that tasks will be included on the overdue reports only if they were completed and data entered. Tasks may be included in the overdue reports if there is a delay in data entry. A delay in data entry may be due to normal processing time or to filing the form in the participant file before data entry is done.

Task completeness reports list participants who are missing one or more tasks for a specific contact and include summary reports indicating the percentage of participants who have completed all tasks. Clinical Centers are encouraged to use these reports regularly to help identify the following types of problems:

- Particular tasks that were omitted on specific participants
- Consistent omissions in performing procedures due to misunderstandings of when the procedures need to be completed (e.g., mammogram every year for HRT participants and every other year for DM participants)
- Forms that have not yet been data entered

5.2.2 Missing Data

Clinical Centers are responsible for collecting all data associated with contacts and tasks. These responsibilities include completing data collection forms, submitting data and specimens (e.g., ECG readings, blood and urine samples, and bone density scans) to the appropriate subcontractors, and completing corresponding data entry.

5.2.2.1 Form Completion and Review (Required)

Clinical Center staff are responsible for completing all applicable items on clinic-administered forms. Instructions for completing forms are located in other sections of the WHI Manuals:

- *Vol. 3 - Forms* includes all WHI forms and instructions for completing all non-outcome forms and *Vol. 8, Appendix A - Outcomes Forms and Instructions* includes all outcomes forms and instructions.
- *Vol. 2, Section 18.2 - Data Collection* includes general instructions for completing forms, including how to record "unknown" responses on both key-entered and mark-sense forms.

Clinical Center staff are also responsible for reviewing participant self-administered forms for completeness by briefly reviewing the forms to assure the participant has not skipped entire pages. No other review of the self-administered forms is required. For example, CCs do not need to review each question on the form for completion, skip patterns, and consistency of responses between questions and other forms. Specific procedures for review of the Food Frequency Questionnaire (FFQ) and Four-Day Food Record (4DFR) are described in their corresponding form instructions and *Vol. 2, Section 6.1.6 - DM Eligibility, 10.1 - The Four-Day Food Record,* and *10.2 - The FFQ.*

CCs are required to run and use the following report checklist:

- *Encounters without Data* (*WHIP 0794*): Use this report to identify forms that need data entry.

CCs are encouraged to use other reports as needed.

5.2.2.2 Medications, Data, and Specimens Sent to and from Subcontractors (Required)

- Medications

  CCs are responsible for maintaining medication inventory, selection, and adherence records for all HRT and CaD medication bottles received from McKesson. CCs are required to run and use the following report:

  - *Drug Inventory* (*WHIP 32*): Use the report to compare the CC HRT and CaD inventory with the records in WHILMA. Follow-up on any discrepancies using the procedures described in *Vol. 2, Section 15.3 - Study Pill Inventory Maintenance.*

- ECGs, Blood and Urine, and Bone Density Data

  The CCC prepares monthly CC-specific reports for data and samples that CCs routinely send to subcontractors. These reports include data on ECG data sent to EPICARE; frozen blood and urine specimens sent to the central repository at McKesson; and bone densitometry results sent to the Bone Density Center at UCSF. The CCC, CCs, and subcontractors use these reports monitor and track the collection and submission of data and specimens. *Appendix D.2 - CCC Subcontractor Reports* lists the ECG reports, giving the report WHIP number, the report name, description of the report, and how to use the reports and actions to take.

EPICARE and the Bone Density Center at UCSF are responsible for reviewing the reports in their respective areas and recommending or implementing corrective action as needed. Problems identified by these two centers are communicated to the CCs and CCC directly for correction.

- ECG Data

  Clinical Centers perform ECGs on participants, submit the data electronically to EPICARE using features in the ECG machine (MAC-PC), and complete *Form 86 - ECG* for each ECG sent to EPICARE. EPICARE processes the ECG data and sends the data to the CCC electronically. The CCC provides both the CCs and EPICARE with summary and detail ECG reports using data received from both the CCs and EPICARE.

  The CCC sends copies of the two summary reports (*WHIP 1021* and *WHIP 1022*) showing the matching rates for VCCs and NCCs by CC to all CCs. The two detail reports (*WHIP 921* and *WHIP 922*) list the details of the unmatched data for each CC, and these reports are sent to the respective CCs. CCs can use these reports to identify mismatches and investigate the reasons for mismatched data as described in *Appendix D.2 - CCC Subcontractor Reports*.

- Blood and Urine Specimens

  Clinical Centers collect blood and urine specimens on participants, process the specimens into aliquots, and ship the specimens to the central repository at McKesson at least once each month as described in *Vol. 2, Section 11 - Blood Collection, Processing, and Shipment*. Clinical Centers document the collection and processing of the specimens on *Form 100 - Blood Collection and Processing* and *Form 101 - Urine Collection and Processing.* EPICARE records the receipt of the aliquots, stores the aliquots, and sends corresponding storage data to the CCC.

  The CCC provides both the CCs and EPICARE with summary and detail blood and urine tracking reports. Two summary reports (*WHIP 1041* and *WHIP 1042* for blood specimens and *WHIP 1047* and *WHIP 922* for urine specimens) showing the matching rates for VCCs and NCCs by CC to all CCs. The two detail CC-specific reports (*WHIP 0941* and *WHIP 0942*) list the details of the unmatched data for each CC are sent to the respective CCs. CCs can use these reports to identify mismatches and investigate reasons for the mismatched data as described in *Appendix D.2 - CCC Subcontractor Reports.*

- Bone Density Scans

  The three Bone Density CCs perform bone densitometry scans on participants, submit the data electronically to the Bone Density Center at the University of California at San Francisco (UCSF), and complete *Form 87 - Bone Density* for each participant. University of California at San Francisco processes the bone density data and sends the data to the CCC. The CCC provides both the CCs and the Bone Density Center with summary and detail reports using data received from both the CCs and UCSF.

  The CCC sends copies of two summary reports (*WHIP 1057* and *WHIP 1052)* showing the matching rates for VCCs and NCCs by CC to all Bone Density sites. The two detail reports (*WHIP 951* and *WHIP 952*) list the details of the unmatched data for each CC, and these reports are sent to the respective CCs. Clinical Centers can use these reports to investigate reasons for nonmatches as described in *Appendix D.2 - CCC Subcontractor Reports*.

5.2.2.3 Data Loss

The CCC provides daily back-up of all CC data to protect each CC from data loss as a result of a CC file server failure. This backup frees the CCs from this responsibility and ensures that a full back-up is done on a regular basis. Note that only files on the file server are backed-up by the CCC. Clinical Centers are required to back-up any files they choose to store on workstation hard drives.

If a file server failure occurs resulting in data loss:

- The CCC will restore the CCs data from the time of the last back-up.

  To prevent possible loss of randomization data, CCs are required to record all randomization's/enrollments on *Form 8 - Randomization Log* as they are completed. The CCC uses this log to reconstruct the randomization in the database if a failure of a CC file server causes the loss of randomization data.

- The CC is responsible for the data entry of any data entered from forms into WHILMA since the last back-up. The CCC will work with the CC to re-enter any medication dispensing data lost.

5.3 Validity of Data

Table 5.2 - CC Schedule for Data Monitoring summarizes the reports that CCs are required to run. The table lists the report name, report number, action to take, and the frequency of the activity. Clinical Centers may run the report more frequently. It also gives a schedule for running and reviewing other recommended CC reports.

5.3.1 Form Features

Assuring accuracy of data collection begins with good forms design. Well-designed forms can help prevent errors in data collection such as marking the form incorrectly or not following instructions correctly. These types of errors are difficult to find and costly and time consuming to correct. WHI forms use many features to reduce data collection errors. Clinical Centers are encouraged to adapt similar guidelines in developing participant materials (see also *Vol. 2, Section 3.1.6 - Participant Material Review Recommendations and Guidelines).*

When time allows, CCs are asked to pilot-test newly developed self-administered forms on age-eligible women. New forms are monitored for problems and minor changes are made if needed at the time of WHILMA upgrades. The Steering Committee approves all major form changes before implementation.

In general, changes in forms are scheduled to occur with the WHILMA upgrade scheduled for each November. All changes in forms are documented with a change in the form version number and date. For major form changes, the form number increases by a whole number (e.g., from 1 to 2) and for minor changes, the form version number increases in decimal increments (e.g., from 1.0 to 1.1). Note that in WHILMA, forms are identified by whole number only, for example, "1.1" is entered as "1".

5.3.2 Duplication

Duplicate data collection is completed for specific data items to help ensure their accuracy and consistency. The following duplicate measures are collected:

- Duplicate blood pressure measurements
- Duplicate functional measures: hand grip dynamometer, chair stand, and timed-walk
- Duplicate measures of bone densitometry showing high bone loss
- Review of the abstracting of lab reports for mammogram, Pap smear, endometrial aspiration and transvaginal uterine ultrasound results onto corresponding data entry forms during QA Visit participant file audit
- Blind duplicate measures of selected blood analysis
- Comparisons between local and central diagnosis of centrally adjudicated events and comparisons with internal data sources (e.g., mammography, Pap smear, endometrial aspiration, ECG, new medications)

5.3.3 Data Entry

Various features are built into WHILMA to help ensure the entered data are valid. See *Table 5.4 - WHILMA Data Entry Features* for a list of these features. These checks serve to prevent the data entry errors made by data entry staff and also to catch errors made by staff recording incorrect data on the forms. Key-entry staff can make corrections to key-entry errors at the time of key-entry. If there is an error in how the data is recorded on the form, data entry staff must return the form to the appropriate CC staff person completing the form for review and correction. (See *Vol. 2, Section 18.2.4 - Editing Forms* for procedures for making corrections to forms.)

CCs are required to run and use the following reports to identify existing data entry errors and inconsistencies in existing WHILMA data.

- *Encounters without data (WHIP0749*): Use this report to identify encounters without data. Key-enter the data as needed or delete encounters with no data.
- *Duplicate encounters (WHIP1949)*: Use this report to identify encounters that are entered more than once. Duplicate data entry may occur when the data entry staff are interrupted during key-entry of forms. To avoid duplicate data entry, review key-entry procedures with data entry staff and establish procedures for ensuring forms are not key-entered more than once. For example, indicate on the form when only the encounter data has been key-entered and when the entire form has been key-entered.

5.3.4 Data Verification

Verification of data entry is periodically performed by the CCC, and the CCC may request the CC to verify selected participant forms. Clinical Coordinating Center Data Coordinator staff performed data entry verification on selected forms as part of the participant file audit for the initial QA Visits to CCs. Verification may be performed on subsequent file audits on a selected basis for annual QA visits. After verification, a detailed discrepancy report is produced for the QA Visit report and includes a list of the following types of discrepancies:

- A form in the participant file is not key-entered into WHILMA
- Data in WHILMA are not documented on the participant forms
- Data in WHILMA do not match data recorded on the form

5.3.5 Data Cross Checks

Inconsistencies in data are monitored for the following areas. CCs are required to investigate and correct the inconsistencies in these data.

- Baseline and Follow-up Hysterectomy Status in HRT Participants

  Data related to a participant's hysterectomy status may be collected on several different baseline forms. The eligibility determination in WHILMA compares these data items for consistency. If a discrepancy is found, the eligibility determination in WHILMA returns a result of INFO to indicate that there is a discrepancy and indicates the problem data items. The CC must resolve the discrepancy and key-enter changes into WHILMA before the participant can be randomized/enrolled.

- Medication Dispensing

  A participant's current hysterectomy status is monitored during each HRT medication selection. WHILMA will give a warning message on the screen during HRT medication dispensation if the participant's hysterectomy status and medication assignment are inconsistent. CCs are required to investigate these inconsistencies, to ensure the message is valid (i.e., is appearing because the participant has had a hysterectomy and not because a form indicating this has been incorrectly entered in WHILMA). If the message is appearing due to a key-entered error, make appropriate corrections in the database. If the message is appearing because the participant has, in fact, had a hysterectomy, contact the CCC for resolution.

5.3.6 Data Corrections

Investigating and correcting data errors can be time consuming and difficult. The large number of data items in WHI makes it impractical to identify and correct all possible data errors. Many of the steps described above, particularly the data entry features in WHILMA, were developed to reduce the chance of data errors at the point of data entry.

CC activities for identifying data errors include:

- Review forms before data entry (see *Section 5.2.2.1 – Form Completion and Review*).
- Identify data problems at the time of data entry by responding to error messages in WHILMA
- Review various reports to identify problem areas and review the issues with CC staff to help prevent future errors. For example, recording incorrect visit type and/or dates can lead to inaccurate reporting of timeliness and completeness of data collection.

CC activities for monitoring appropriate data corrections includes:

- Follow standard procedures for documenting data corrections. (See *Vol. 2, Section 18.2.4 – Editing Forms.)*
- Review forms for correct documentation of data corrections, as part of the participant file audit performed with QA Visits. (See *Section 4.3.3 – Participant File Audit*.)

Data requiring regular review and corrections have been identified based on study priorities, and include:

- Discrepancies between the date the participant signed the informed consent forms and the date recorded on *Form 11 – Consent Status* (including *Forms 11, 12, 13, 14,* and *15*) and data entered into WHILMA. Correct the *Form 11*. You do not need to correct *Forms 11-14* in WHILMA. However, you should correct Form 15 – CaD Consent in WHILMA if it is incorrect.
- Discrepancies in data on an HRT participant's hysterectomy status. Correct any discrepancies to ensure participants receive the appropriate HRT study medication based on current hysterectomy status. Correct any data discrepancies in hysterectomy status on the appropriate form and in WHILMA. Discrepancies may occur on the following forms:
  - *Form 2/3 - Eligibility Screen*
  - *Form 10 - HRT Management and Safety Interview*
  - *Form 33D - Medical History Update (Detail)*
  - *Form 81 - Pelvic Exam*
  - *Form 82 - Endometrial Aspiration*
  - *Form 131 - Report of Hysterectomy (HRT)*
- Discrepancies between an HRT participant's hysterectomy status and her medication assignment
- Errors in transcription of test and lab results found during participant file audits
- Incorrect or incomplete participant addresses or names

5.3.7 Quality of Data Collection

The CCC provides the following reports to monitor the quality of several procedures for which performance goals are defined in *Section 6.1 - Performance Goals*. If the performance at your CC is below the performance goals, review procedures to help identify ways to improve performance.

- ECG quality grades *(WHIP 1023)* included in the set of the CCC quarterly subcontractor reports.\
- PMC Report (Quarterly packet)

5.3.8 Measurement Reliability

The Observational Study Measurement Precision Study (OS-MPS) was designed to test the reliability of certain measures, including selected self-administered baseline forms and blood analysis. See *Vol. 2, Section 8.4* for details.

5.4 Timeliness

Timely collection of data and data entry are necessary for good data monitoring and facilitates data analyses. Collection of data at follow-up contacts within the specified window and timely processing of data, such as outcomes processing and data entry facilitates prompt review and evaluation of the data. The following types of data are monitored for timeliness and completeness:

- Follow-up contacts performed in the appropriate time window (see *Vol. 2, Section 16, Table 16.1 – Time Limits for Collection Tasks*).
- Data entered into the database within 2 weeks of data collection.
- Timeliness of various outcomes processes, including collection of *Form 33 - Medical History Update* and *Form 33D - Medical History Update - Detail* in window, assembly of outcomes packets and assignment to local adjudicator, local adjudication, and total time to close out a case.

Table 5.2

A. CC Schedule for Data Monitoring – Required *

WHIP #	Report Name *Menu Path*	How often	How to use/Comments
	Required		
33	Medication Inventory Activity *Reports/Coordination Reports*	Quarterly	Use to confirm that HRT (including open-label) and CaD dispensations are being entered correctly in WHILMA. Compare report with actual bottles in medication cartons. Verify that bottles listed as dispensed are not in cartons and bottles missing from carton are listed as dispensed on the report. See *Vol. 2, Section 15 - Study Pill Inventory Maintenance* for directions for making corrections.
101	Participants Requiring Follow-up for Management, Change of Medications or Adherence *Reports/Member Reports/Reminders*	Monthly	Use to identify participants who need re-contact as recorded on *Form 10 – HRT Safety Interview*, *Form 17 – CaD Safety Interview*, *Form 24 – Adherence and Retention Worksheet*, and *Form 54 – Change of Medications*.
148	Follow-up Visit Information *Reports/Member Reports/ Individual Members*	As needed before F/U visits	To identify the tasks that need to be completed for a participant at a given follow-up visit. Can be used as a visit checklist. This report can be run in batch mode (instead of individually by participant) using the WHILMA batch reporting feature. Note: *Tasks Required at Visit (WHIP0144)* can be used instead of *WHIP0148*.
230	Outstanding HRT/CaD bottles *Reports/Member Reports/Reminders*	Monthly	Remind participant to return bottles
405	DM Intervention Year Summary *Reports/Diet Reports*	Quarterly	Use to monitor session participation based on length of time in the intervention. Compare to study-wide data reflected in DM Intervention Year Summary (CCC0023) published quarterly by CCC
419	DM Session Adherence Summary Report *Reports/Diet Reports*	Quarterly	Use to monitor session participation based on length of time in the intervention. Compare to study-wide data reflected in DM Intervention Year Summary (CCC0023) published quarterly by CCC.
427	Session Attendance and Make-up Activities *Reports/Diet Reports*	Quarterly	Use to monitor overall DM intervention progress for each DM intervention group. Alternatively, the LN may run the Overall Progress reports for Group Attendance (426), Session Completion (421), Home Activity Completed (422) and Fat, Fruit/Veg, Grain Scores (423).
432	Unassigned DM members *Reports/Diet Reports*	Quarterly	Use to confirm that participants are not removed from groups after having started intervention. There should be no participants listed in the "Currently Unassigned - Have Previously Started" section.

* See *Volume 8, Appendix I* for Required Outcome Reports

Table 5.2

A. CC Schedule for Data Monitoring – Required (Continued)

WHIP #	Report Name *Menu Path*	How often	How to use/Comments
	Required		
436	Group Session Performance *Reports/Diet Reports*	Year 1: after sessions 8,12, 16 Years 2+: every 6 months	Use to ensure thorough and accurate DM Intervention data collection and key-entry: • Track makeup completion • Track score collection • Verify accuracy of key-entry. [Note: Strongly recommended that this report be run after every session]
444	IIP Triage & Tracking *Reports/Diet Reports*	Quarterly	• Use to track participation in DM intervention activities (attendance, completion, self-monitoring) • Use to identify and track participants having Interrupted DM Intervention Participation (Level 4). • Use to identify and track inactive DM Intervention participants, e.g., stopped DM Intervetntion, stopped follow-up (no follow-up and absolutely no follow-up), lost to follow-up, and deceased.
TMC001	TMC Member Tracking Report *Reports/Diet Reports/TMC Reports*	Quarterly	Use to monitor stopped DM-I participants still assigned to groups. Use the parameter DM-I status – Stopped. All Stopped DM-I participants should be listed as Unassigned (U). When these participants are identified, determine if the 'stop' status is correct. If you find a stopped DM-I participnat who is still assigned to a group, remove the participant from her Dietary Change group. If the participant is active in DM-I, work with the Retention Specialist/Clinic Manager to change the participant's DM Intervention participation status to 'active' on *Form 7 – Participation Status*.
611	Members with Incomplete Address or Long Name/Address *Reports/Member Reports/ Quality Assurance*	Quarterly	To identify addresses that are incomplete or too long to fit on a mailing label. Review and correct addresses as necessary, giving priority to randomized/enrolled participants. Note that there are two lines for street address -- please use both lines for long addresses.
618	Tasks Not Completed at Member Follow-up Visit *Reports/Member Reports/ Individual Members*	Monthly	To identify tasks that were not done for participants at a specified follow-up visit due during a specified period of time, or that were done out of window. This report can be run in batch mode (instead of individually by participant) using the WHILMA query batch reporting feature. Use expanded windows.
782	Members with Missing Labs *Reports/Member Reports/ Quality Assurance*	Monthly	To identify participants whose lab/test results (*Form 82, 83, 85, 92*) have not been received and/or entered in WHILMA

Table 5.2

A. CC Schedule for Data Monitoring – Required (Continued)

WHIP #	Report Name *Menu Path*	How often	How to use/Comments
	Required		
783	Members with Missing Bloods *Reports/Member Reports/ Quality Assurance*	Monthly	To identify participants whose CBC and triglyceride results have not been received and/or entered in WHILMA. This report identifies participants for whom a *Form 100* is entered, but results are not. It only works for *Form 100s* that you enter as soon as they are initiated (i.e. as soon as blood is drawn and processed) and have Cryovial #16 entered.
794	Encounters without data *Reports/Member Reports/ Quality Assurance*	Monthly	Review report and delete any tasks that were entered in error. Clean up data for randomized or enrolled participants. Do not clean up screening data. This report will not show encounters without data for the following tasks: 43, 44, 45, 64, 910, 920, 950, 951, and 955.
1206	OS Members needing clinic F/U *Reports/OS Follow-up Reports*	Monthly	Use to identify OS participants who have not returned their most recent forms packet. Contact the participants and administer *Form 33*.
1211	Members With Undeliverable Addresses *Reports/Member Reports/All Members*	Monthly	To identify participants with the "undeliverable address" flag in the member data screen set to "Y" You must manually delete the undeliverable address flag of the "Y" when an address has been corrected in WHILMA
1227	Referral Follow-up *Reports/Member Reports/ Quality Assurance*	Monthly	To identify participants who have abnormal lab/test results and/or who have been referred for follow-up, but do not have follow-up data entered
1229	Inconsistent Medications *Reports/Member Reports/ Quality Assurance*	Monthly	To identify women whose HRT medication assignment is inconsistent with current hysterectomy status • Check accuracy of hysterectomy information as entered from *Form 10*, *Form 33D*, and *Form 131*. • Contact CCC if medication assignment needs to be changed based on hysterectomy status.
1265	HRT/CaD Adherence *Reports/Member Reports/Adherence*	Quarterly	Use to identify participants who are below 80% adherent on HRT or CaD.

Table 5.2

A. CC Schedule for Data Monitoring – Required (Continued)

WHIP #	Report Name *Menu Path*	How often	How to use/Comments
	Required		
1400	HRT Participants reporting bleeding on *Form 10* *Reports/Member Reports/Safety*	Monthly	Use to identify participants who may need follow-up of reported bleeding.
1591	Participants who are Lost to Follow-up *Reports/Retention Reports*	Monthly	Use to identify CT participants who have not had a *Form 33* or a contact recorded on *Form 23* for 18 months (24 months for OS participants). Contact participants to determine vital status and collect *Form 33* if possible.
1612	HRT Mammogram Safety Monitoring *Reports/Member Reports/Safety*	Monthly	Use to identify participants who were dispensed HRT when their most recent mammogram was over 18 months old.
1613	Participants Dispensed HRT/CaD Pills After a Definitive Clinical Safety Event was Reported *Reports/Member Reports/Safety*	Monthly	Use to identify participants who have a study pill dispensation date that is after the date of a potential safety event. Run the *Safety Condition Criteria Report (WHIP1443)* to view responses on forms that are considered "safety events".
1949	Participants with Duplicate Encounters *Reports/Member Reports/ Quality Assurance*	Monthly	Use to identify encounters for a participant that have the same task ID and date. Delete any duplicate follow-up (non-screening) encounters.

Table 5.2

B. CC Schedule for Data Monitoring – Recommended *

WHIP #	Report Name *Menu Path*	How often	How to use/Comments
428	Individual Progress *Reports/Diet Reports*	Year 1: after sessions 8,12, 16 Years 2+: every 6 months	Use to monitor individual progress. May be given to participants as progress update.
478	Latest Participation Status of Members *Reports/Member Reports/All Members*	Quarterly	Use to track any follow up or intervention status for all participants.
751	DM Intervention & Follow-up Status *Reports/Clinic Consolidation Reports/Study Intervention Status, and Adherence Reports*	Quarterly	Use to monitor overall follow-up and intervention status for DM participants. Compare to study-wide data reflected in DM Intervention & Follow-up Status (0751) published quarterly by CCC.
793	Mammogram Due *Reports/Member Reports/Reminders*	Monthly	To identify participants who are due for a mammogram.
787	Post-Randomization Contact Reminder *Reports/Member Reports/Reminders*	Monthly	To identify participants due for a follow-up contact in a specified time period
1144	Members needing an HRT or CaD Dispensation *Reports/Member Reports/ Quality Assurance*	Monthly	To identify participants who may need to have HRT or CaD dispensation
1410	Members in Subsample *Reports/Member Reports/All Members*	Monthly	To identify participants who need subsample tasks done at follow-up visits. Will only show subsamples for visits up to 18 months in the future.
1947	Member Addresses with Characters that Interfere with Label Printing *Reports/Member Reports/ Quality Assurance*	Monthly	Use to identify characters in the database that may interfere with the printing of the Personal Information Update report or the address labels. In WHILMA, review the address and contact information for each participant on the report. Delete any backslashes and any parentheses that appear in these fields (except that parentheses around the area code in the phone number may remain).

* See *Volume 8, Appendix I* for Recommended Outcome Reports

Table 5.3
WHI Form Features

- Clean design with effective use of blank space so that questions are easy to read but form does not seem too long
- Font and size (at least 12 point) of print on self-administered forms that is easy to read
- Mixed-case rather than all capitals letters
- Standardization of format, questions, and forms
- Simple vocabulary and sentence structure
- Response fields close to the questions
- Logical sequencing, physical alignment, and indentation of questions
- Directional arrow for skip patterns
- Check boxes rather than blank lines for recording responses, whenever possible
- Necessary diagrams included on the form
- Physical alignment of response fields whenever possible
- Consistency of coding within and between forms
- Mutually exclusive responses
- Numerical or discrete codes wherever possible
- An indication of the number of digits allowed for a response and placement of a decimal point for values
- Units of measure for a response printed next to the response field
- Questions numbered for easy reference
- Each version of the form numbered and dated
- Space for identification of the participant on each required form

Table 5.4

WHILMA Data Entry Features

- Checks for valid values to prevent entry of invalid data. In general, error messages are of two types: "fatal" and "warning". A fatal error prevents the user from entering a certain item - it must be changed to an acceptable response or deleted before the user can mover to the next field. A warning message tells the user that a value is out of the expected range for that item, but is still acceptable. These checks include:
  - Valid value checks for categorical variables, allowing entry of only valid codes as indicated on the forms.
  - Range checks for continuous variables, such as age, weight, blood pressure, to prevent entry of out-of range values and to warn of data that are outside the usual expected range.
  - Checks for valid date variables, such as future or past dates when not applicable.
- Repeat verification of participant ID number before encounter data can be committed.
- Check-digits on unique identifiers (participant ID number; blood, urine, and endometrial aspiration sample numbers; and study medication study boxes) to help ensure that they are entered correctly. Each unique number has preprinted labels to eliminate the need for transcribing the numbers to forms and bottles. Each preprinted label also contains a bar-code to allow for scanning rather than key-entry of the unique number.
- Automated skip patterns that follow the form skip patterns to enhance efficiency of data entry.
- List-of-value feature enables user to look up and select from allowable codes to enter in a field.
- Automated, rather than hand, calculation of values where feasible(e.g., BMI, average BP, adherence percent).
- Required entry of form identifiers such as form and version number.
- Automated eligibility determinations. Each protocol-defined exclusion criteria has associated data items that must be entered into the database. A few exclusion criteria require CC discretion to evaluate (e.g., expected survival less than three years), but in all cases these must be documented in the database. All of these items are assessed by an automated database function, and the woman's eligibility is ensured before she can be randomized or enrolled. The CCs have no ability to circumvent this requirement without changing previously recorded values. Clinical Center staff should not change previous recorded data except to update eligibility information or correct errors.
- The randomization function in WHILMA enforces the randomization of a participant into HRT and DM on the same day.
- All records entered into the database stamped with date, time of entry, and employee identification number of user logged into WHILMA.
- Use of mark-sense forms where possible to reduce key-entry errors.
- Medication dispensing controlled by requiring data entry of both the participant ID number and bottle number and repeat verification of participant ID number before committing bottle selection.
- Use of commercial medication database (Medi-Span) to ensure accurate entry of current medications.
- Restrictions on ability to change or delete critical data items.
- WHILMA enforces a time limit on randomization of 6 months from the earliest SV1 date.
- WHILMA does not allow CCs to delete the final eligibility determination encounter for a randomized participant.
- To change eligibility data after randomization, WHILMA requires CCs to document in the database the reason for the change. WHILMA maintains an electronic record of eligibility data updated after randomization.
- WHILMA requires the data entry of all eligibility data and baseline forms before CCs can randomize or enroll a participant.
- WHILMA provides automated enrollment into an ancillary study.

Section 5
Data Monitoring

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Tables