



NATIONAL CENTERS OF
EXCELLENCE
IN WOMEN'S HEALTH

**Telemedicine in the
National Centers of Excellence
in Women's Health**

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OFFICE ON WOMEN'S HEALTH
U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES

The National Centers of Excellence (CoEs) in Women's Health were established by the Office on Women's Health within the Department of Health and Human Services in 1996. Their mandate is to establish and evaluate a new model health care system that unites women's health research, medical training, clinical care, public health education, community outreach, and the promotion of women in academic medicine. Their mission: to improve the health status of diverse women across the life span.

Telemedicine uses electronic communication and information technology to provide clinical care and exchange medical information from a distance. It holds great promise for improving health care access, services, and quality to people living in remote areas or places that are medically underserved. This pamphlet highlights activities and programs at the CoEs that use new telemedicine technologies to advance women's health.

- ◆ **Teleradiology** is the electronic transmission of radiological images from one location to another for consultation and or interpretation. Because teleradiology increases patient access to quality radiological care by providing diagnostic capabilities of a major medical center to any hospital, regardless of size or location, it has an important role to play in improving women's health.
- The University of Maryland, with Baltimore VA Medical Center Department of Diagnostic Radiology, developed an integrated department with a wider area network (WAN) in which outlying medical centers can use the VA's image

management and communication system. The VA uses VISTA imaging for nonradiology nuclear medicine images (i.e., pathology, GI endoscopy and dermatology). The digital radiology system has evaluated the diagnostic quality and cost-effectiveness of digital mammograms and other teleradiology applications.

- Funded by the National Library of Medicine, the University of Pittsburgh installed equipment in six locations in western Pennsylvania including Magee Women's Hospital. Using the image archiving initiative – called the PACS project – they developed a virtual radiology archive that will allow end-users at remote sites to access a variety of image types through desktop computers. These digital images will be available for inclusion in medical records. The PACS system will also form the basis of a large teaching file that can be used for education of students, residents, and physicians.
- At the University of Pennsylvania, the radiology department is a digital department, with nearly all of the studies done without the use of film. The image data is acquired digitally, stored on archives and read on workstations. It is easy to acquire images from remote locations; in fact their department covers one of the sister hospitals (Presbyterian) electronically on nights and weekends. In addition, services are provided to imaging centers in Ohio, New Jersey, New York and a variety of sites in Pennsylvania. The internet is used extensively to distribute images to referring physicians.
- Partners HealthCare System, the joining of Harvard Medical School's two major teaching hospitals, Massachusetts General Hospital and Brigham and Women's Hospital, has established Partners Telemedicine. This international service provides

teleradiology consultations to improve health care and the lives of patients.

- ◆ **Telemammography**, a specialized field of teleradiology, is exploring techniques to improve the effectiveness of screening mammography to detect breast cancer.
 - The University of Wisconsin employs digitizing analogue mammograms and uses computer algorithms to highlight abnormalities found using mammography. Specific algorithms are being analyzed that will detect temporal changes between mammography exams.
 - Wake Forest is conducting research to determine telemammography's ability to reduce morbidity and mortality from breast cancer by enhancing the interpretation of screening mammography. They are currently investigating telemammography with an emphasis on soft copy mammogram interpretation.
- ◆ **Telepsychiatry** consultations can expand the reach of psychiatry services to women, who suffer disproportionately from certain mental illnesses like depression and anxiety disorders.
 - The Department of Psychiatry at the University of Maryland School of Medicine, in partnership with the local health department, provides child and adolescent psychiatry consultation services in underserved areas of Somerset County. This team evaluated the effectiveness of the project in providing accurate diagnosis and treatment and is assessing patient perceptions and satisfaction with remote consultations.
 - Wake Forest is involved with projects examining the use of telemedicine in underserved populations such as Hispanics,

for patients with Alzheimer's disease, and to meet rural mental health needs. Telemedicine could also be used to expand mental health services to women, who have high rates of depression and are disproportionately affected by conditions like Alzheimer's disease.

- Telepsychiatry consultations from professionals at the University of Pittsburgh have been offered to state correctional facilities.
- An inpatient psychiatry unit at a satellite site of Beth Israel Deaconess Medical Center, a Harvard-affiliated teaching hospital, provides a telemedicine link to the emergency room when psychiatric patients need to be evaluated by emergency room physicians.
- ◆ **Telepathology** has seen rapid growth due to improvements in high quality, digital-imaging technologies.
 - The University of Pittsburgh's Center for Biomedical Information, associated with the Magee CoE, has an initiative that involves digitization of gross and microscopic images for remote consultation, medical record documentation, and teaching. This telepathology system will add the capability of having a concurrent consultation with the referring physician.
 - At Indiana, dermatopathology consultations are conducted on-line.
 - At the University of Pennsylvania, telepathology activities are under development that will allow consultations on frozen sections from neighboring hospitals. This system will also be used for research projects; for example, the modalities of image transfer will be tested for their efficacy in rendering

diagnoses. Additionally, optimal teaching strategies will be developed and tested using this technology.

- Partners Telemedicine at Harvard Medical School conducts thousands of telepathology consultations.
- At the University of California, San Francisco School of Medicine, the Division of Surgical Pathology has a Roche Image Analysis System equipped with Roche ImageManager, a high-speed modem and a high-resolution monitor. This system allows the immediate review of frozen section images and selected cases. Interactive consultations are possible, and a permanent database of images is maintained.
- ◆ **Teledermatology**, also benefiting from improvements in image quality, is expanding the reaches of this specialty field.
 - University of Maryland is conducting a research project to find an acceptable data flow rate for patient and physician satisfaction in live, two-way interactive teledermatology evaluations. In this project, diagnostic accuracy of the teledermatology evaluations was contrasted with paired in-person visits. These findings will have an impact on the quality and accuracy of dermatology evaluation via communications technologies.
 - Wake Forest University, through a subcontract from Eastern Carolina University, is conducting teledermatology consultations in the state prison system. This is a pilot project to ensure transmission quality; once the quality is established, this project will be expanded to provide services for other sites.
 - At the University of Pittsburgh, teledermatology consultations have been offered to state correctional facilities. They are

developing an Internet-based image archive that will support inclusion of images in medical records and form the basis of teaching files.

- Harvard Medical School's Partners Health Care System is conducting pilot research in the field of teledermatology.
- Ohio State University telemedicine program offers dermatology direct and consultative care to Ohio's inmate population.
- ◆ **Teleoncology** is expanding the realm of cancer care—both clinical and psychosocial.
 - The University of Maryland uses digital and fiber optic, real-time interactive systems to link with other area hospitals and cancer centers. This equipment provides continuing education, consultations, and clinical assessment services.
 - Harvard's Cancer CareLink serves to connect cancer patients with physicians and staff, in addition to a support service that will link other cancer patients together. The site will connect patients to information, their caregivers, their family members, and each other, thus making the difficult process of undergoing treatment more manageable.
- ◆ **Other specialty fields** are engaging in new telemedicine technologies to enhance and improve patient care.
 - The Maryland Brain Attack Center at the University of Maryland employs the TeleBAT system. This telemedicine system allows for neurological diagnosis and treatment to begin while the patient is still in transit to the hospital, dramatically shortening time to treatment for acute ischemic stroke (brain attack) patients.

- At the University of Pittsburgh, the Division of Cardiology supports the implementation of invasive cardiology services in regional communities through the use of imaging systems that permit remote diagnosis and consultation. Additionally, interactive video conferencing equipment has been installed to improve the technical quality of neonatal echocardiograms and to make these images available for remote specialty consultations. This system is designed to improve the appropriateness of neonatal cardiology transfers.
- University of Pittsburgh is also developing Internet-based image archives that will support inclusion of teleophthalmology images in medical records and to form the basis of teaching files.
- Harvard is playing a pioneering role in telesurgery techniques, which involves showing live surgeries from local area hospitals.
- In partnership with the Ohio Department of Rehabilitation and Correction, the Ohio State University telemedicine program uses telemedicine as a means to deliver direct and consultative care to Ohio's inmate population. The telemedicine network has 30 sites, including five prisons which house female inmates. Our clinicians, representing practitioners in 13 specialties, offer routine clinical care in the following fields: cardiology, dermatology, surgery, infectious disease, pulmonary care, general medicine, neurosurgery, plastic surgery, thoracic surgery, dialysis and renal care.

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Boston University Medical Center, Phone: 617-638-8035,
Internet: www.bmc.org/coewh/

University of California, Los Angeles, Phone: 800-825-2631,
Internet: www.med.ucla.edu/womens/

University of California, San Francisco, Phone: 415-885-7273,
Internet: www.itsa.ucsf.edu/~ucsfcoe/

Harvard University, Phone: 617-732-8798,
Internet: www.hmcnet.harvard.edu/coe/

University of Illinois at Chicago,
Phone: 312-413-1924, Internet:
www.uic.edu/orgs/womenshealth/index.html

Indiana University School of Medicine, Phone: 317-274-2754,
Internet: www.iupui.edu/~womenhlt/

Magee -Womens Hospital, Phone: 412-641-6003,
Internet: www.magee.edu/cewh2.htm

MCP Hahnemann University,
Phone: 215-842-7041, Internet:
<http://www/mcphu.edu/institutes/iwh>

University of Michigan, Phone: 734-763-0984,
Internet: [www.med.umich.edu/whrc/
ctr.excel.html](http://www.med.umich.edu/whrc/ctr.excel.html)

Ohio State University, Phone: 614-293-6937,
Internet: www.osumedcenter.edu/women/

University of Pennsylvania, Phone: 215-898-0147,
Internet: www.obgyn.upenn.edu/cewh/

University of Puerto Rico, Phone: 787-753-0090,
Internet: www.rcm.upr.edu/2klwhc

Tulane University and Xavier University of Louisiana,
Phone: 504-585-6156, Internet: www.tulane.edu/~tuxcoe/

Wake Forest University, Phone: 336-713-4220,
Internet: www.wfubmc.edu/women/

University of Washington, Seattle,
Phone: 206-598-8986, Internet:
www.depts.washington.edu/~uw98coe/

University of Wisconsin, Madison, Phone: 608-267-5566,
Internet: www.womenshealth.wisc.edu/

Yale University, Phone: 203-737-5820, Internet:
<http://info.med.yale.edu/womenshealth/>

**OFFICE ON WOMEN'S HEALTH,
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NATIONAL CENTERS OF EXCELLENCE IN WOMEN'S HEALTH

PAMPHLET SERIES STAFF

Susan Clark, Project Officer for the National Centers of Excellence in Women's Health Program, Director, Division of Program Management

Elizabeth Carey, Public Health Analyst

Paul DiNenna, Administrative Assistant

Darryl Dunlap, Administrative Assistant

Valerie Gwinner, Senior Program Analyst

Jennie Kim, Public Health Analyst

Anna Kindermann, Public Health Analyst

Carol Krause, Director, Division of Communications

Sandi Lowery, Special Assistant

Dwana Lynch, Intern

Jennifer Schlesinger, Intern



For more information contact:

**Office on Women's Health
U.S. Department of Health and Human Services
200 Independence Avenue, SW, Room 712E
Washington, D.C. 20201
phone: (202) 690-7650
fax: (202) 401-4005**

