

1. PROJECT PURPOSE

Problem. In 1995, over 26,700 cases of suspected child abuse were reported to child protection agencies in Oregon. In response to this issue and at the direction of the State Legislature, communities throughout Oregon have established coordinated, multidisciplinary team strategies to serve child abuse victims. Professionals from medicine, mental health, law enforcement, child protection, prosecution, and the schools work together to assess cases of suspected child abuse and provide appropriate intervention and treatment. Medical diagnosis plays a critical role in determining outcomes for the child protection and legal systems. Unfortunately, the inclusion of medical evaluation in this coordinated approach is problematic. (There is reluctance by medical providers to provide child abuse evaluation without professional support, because a misdiagnosis of abuse can have significant repercussions for professionals working in this domain.)

The ability of many communities to attract and maintain quality medical providers to conduct child abuse evaluation and treatment is diminished because providers in rural areas are isolated from other child abuse examiners and find it impossible to get adequate consultation in their local communities. This lack of access to high quality, expert evaluation resources in small communities places children at risk of further abuse by impairing the communities' capacity to accurately determine whether abuse has occurred. As a result, children often do not get the appropriate intervention and medical treatment. Further, the nature of child abuse requires that medical providers have timely access to consultation services. Bruises and vaginal/anal tearing and irritation heal quickly, and sending children home without making an accurate diagnosis may place them at continued risk of abuse. Misdiagnosing the presence of abuse can also have serious impact for both the child and the alleged perpetrator. Some medical providers do not use colposcopy necessary to conduct certain aspects of abuse examinations, because they do not have access to professional consultation.

The problems can be summarized as follows:

- children and families are at risk from misdiagnosis of child abuse
- other child abuse professionals struggle in their work when child abuse is misdiagnosed
- communities lose medical providers who feel isolated and unsure of their expertise
- providers are unable to get specialized consultation in their own communities
- medical providers are unaware of others furnishing these services in other parts of Oregon
- providers have no means to convey imagery documentation to experts outside their area

Solution. We propose to alleviate the problems associated with limited access to specialized child abuse evaluators by instituting a statewide network for medical providers through the development of interactive relationships among distant specialists and examiners throughout Oregon. By employing a telemedical consultation strategy that utilizes standard telephone lines and specialized image communication software, medical providers in nine remote locations will send medical images, patient information and any relevant clinical data to three programs that have a history of providing consultation for a second opinion. The following scenario demonstrates how medical providers will use this project to disperse child abuse medical expertise throughout Oregon:

A pediatrician in Umatilla County examines a child who is suspected of having been abused. Using a video colposcope, the pediatrician documents hymenal abnormalities. Uncertain of the significance of this finding, the pediatrician seeks consultation from a child abuse specialist in Portland. Loading the videotape into a VCR attached to the project workstation and image communication software, the colposcopic image is transmitted via modem over standard phone lines to a child abuse expert at CARES NW. The consultant receives the image, reviews the documentation, and determines that the findings are consistent with the history of abuse given. The

consulting doctor makes notations on the image explaining how she reached this determination, and sends the image back to Umatilla County. The pediatrician asks clarifying questions while indicating specific details on the computer image. Four months later the pediatrician has a similar case finding. This time she feels comfortable in proceeding to make a diagnosis.

This project has several innovative characteristics. First, it applies existing technology primarily used in radiology, oncology, dermatology, neurology and cardiology to provision of child abuse evaluations. Second, the project integrates a variety of medical providers practicing in diverse settings, including hospitals, community-based private nonprofits and local government centers- a notable collaboration among public and private sectors. Third, this project utilizes telemedicine as a means to benefit not only the medical community and the families they serve, but also twelve multidisciplinary programs that blend medical services with child protection, law enforcement, prosecution and mental health services. This will promote integration of a health care component outside of a traditional medical setting. Finally, the project is supported by a cooperative structure through the State Office of Services to Children and Families (SOSCF)/Child Abuse Multidisciplinary Intervention (CAMI) Program which is part of the Child Protective Services Unit, the Oregon Network of Child Abuse Assessment and Advocacy Centers (ONCAAAC) and the Oregon Health Division's Advisory Council on Child Abuse Assessment. These programs together have successfully developed a consistent response to child abuse and child fatality that is coordinated at the state level and implemented by local communities. This includes a state funding mechanism for child abuse assessment and advocacy centers, statewide coordination of services, development of best practice standards for centers, training, and establishment of quality assurance strategies.

Expected Outcomes. It is anticipated that this project will improve rural access to specialty practitioners and consultation, and increase medical expertise in traditionally underserved areas. This collaborative effort will enhance decision making in local communities among medical professionals, child protection, law enforcement, and prosecution. Further this access to specialty support will assist rural communities in attracting and maintaining medical providers to conduct abuse evaluations by securing professional support and reducing isolation. In addition, rural communities will experience increased confidence in their providers because respected, experienced experts validate the local examiner's diagnosis. Creating a link between medical experts and referring providers also creates a natural mentoring program. This linkage will educate referring medical providers, ultimately developing local experts. As the expertise of referring providers evolves, the network can mature into a structure for reciprocal peer consultation.

This project will also have tertiary effects on the larger statewide system of coordinated child abuse evaluation and treatment. Consultation and information sharing will promote consistency in diagnosis among providers statewide. Misdiagnosis will be reduced, thus decreasing the disastrous results of over or under diagnosis on the child and the alleged perpetrator. The network can act as a vehicle to distribute information and share unique cases with providers and has the potential to be used as a research and education tool. It provides a forum and means of quality assurance through professional consultation and review.

We anticipate expanding this project beyond the nine referring sites currently identified. There are approximately ten additional locations in rural Oregon that would benefit from this service. The initial sites were picked for implementation because they have already established or will soon begin providing medical examination services to a significant proportion of Oregon's children.

This project is a prime candidate for national replication. It models partnership among public

agencies, hospitals and community-based private nonprofit organizations, and is easily transferable to programs nationwide regardless of size or location. In addition, a national coalition of over 355 child abuse assessment and advocacy centers in 48 states provides a natural platform for project replication, with the potential of generating a seamless, nationwide network of child abuse experts. The project applies readily available, user-friendly technology which requires limited training time and incurs minimal on-going expense. Coupled with the unlimited capacity to increase the number of users across any geographic distance, it is feasible for organizations of various sizes and financial resources to strengthen health care delivery through incorporation of low cost telemedicine.

2. PROJECT FEASIBILITY

Technical Approach. This project will implement a medical information system for remote consultation. At project start-up, three child abuse assessment centers will be consulting sites and nine centers will be referring sites. (See Appendix A for Site Map.) Each project site will have a colposcope, a video and/or a 35mm camera, a VCR and/or scanner available for this project. Ability to perform colposcopy and access to necessary equipment, or the ability to purchase this equipment, was a condition of being a site selected for this project. In addition, each project site will be equipped with a workstation, including a Pentium 100 IBM compatible with a minimum of 16 megs of RAM, a 1.2 GB hard drive, parallel port, 2 hi-speed serial ports, graphics adaptor, video capture board, Windows for Workgroups and image communication software. The proposed software was designed specifically for use in medical settings. Consequently, issues of security, documentation of evidence, ease of use and tools needed to enhance simultaneous viewing and annotation of images have been incorporated. This program also includes the ability to view and print more than one image at the same time, measuring tools to determine the length or area of an injury, pan and zoom functions, and comments or notes in the basic patient image database attached to the image. Images for each patient are stored together in the same folder and are easily accessible for later evaluation or transmission. Through this system, colposcopic documentation, imaging studies such as x-rays and other photographs will be scanned into site computers and sent with relevant patient information over standard phone lines to a consulting site running an identical system (See Appendix B for Systems Diagram.)

Interoperability and scalability. The proposed system is a Windows based program and can be integrated with other information systems at project sites in the future. This project can easily expand to accommodate additional growth beyond the scale of this proposal, including increases in the number of patients at each project site, an expanded number of involved sites and an enlarged geographic area served. Additional sites can be added at any time, anywhere there is a standard telephone line. The image communication software identified for this project is available in the marketplace, and was chosen for the reasons outlined in the following section.

Alternatives. Three options were identified as potentially serving our needs. Picasso, a teleconferencing system was considered, but image resolution was not well defined and the system required specialized equipment that was not readily available. Videoconferencing was explored but is beyond the scope of our needs. Image communication software was also identified, references checked, and a demonstration held. The program was easy to install and operate, had few limitations on size and type of images that be sent or viewed, required standard hardware, has no proprietary components and would allow future project expansion. No comparable software could be identified. We determined that this option best met our needs. (See Appendix C for Information Letter.)

Maintenance. Project maintenance is expected to be minimal. Initial hardware acquired for the project will be adequate to support future software upgrades. Individual project sites will be responsible for continuing expenses, including technical support, telephone charges and medical consultation fees. Sites have ongoing funding from the state CAMI Program to support these costs.

Applicant Qualifications. **Project Administration-** The State Office for Services to Children and Families (SOSCF)/Child Abuse Multidisciplinary Intervention (CAMI) Program, the Oregon Health Division's Advisory Council on Child Abuse Assessment and the Oregon Network of Child Abuse Assessment and Advocacy Centers (ONCAAAC) will serve as partners for the project. SOSCF has extensive experience in information infrastructure projects, including the development and statewide implementation of both the Family and Child Information System (FACIS), a child protection database, and Integrated Information System (IIS), a client provider and fiscal information system. The CAMI Program has a solid history of providing technical assistance, program development expertise and funding to child abuse assessment centers throughout Oregon. The Advisory Council will develop statewide policy guidelines and oversee project evaluation. The Council has been responsible for the development of statewide standards for conducting child abuse interviews which will be published for national distribution, and is currently designing similar standards for medical examinations. ONCAAAC serves as the support network and guidance body for all assessment and advocacy centers in Oregon and includes representation of administrators from all project participants. SOSCF-CAMI, the Advisory Council and ONCAAAC have established positive working relationships with all project sites. (*See Appendix D for Oregon Revised Statutes on CAMI and the Advisory Council on Child Abuse Assessment.*)

Consulting Sites- Three sites will provide consultation. CARES NW, a program of Emmanuel Children's Hospital, has provided child abuse assessments in the Portland Metro Area for over 10 years. Dr. Jan Bays, CARES NW lead medical provider, is a nationally recognized medical expert on child abuse. Dr. Leila Keltner, interim medical director at CARES NW, has experience implementing information infrastructure projects through participation in CRESAC, an information network pilot project of Santa Clara Valley Medical Center. (The KIDS Center is a community-based nonprofit organization in Bend serving children in a 4 county area) Dr. Susan Reichert, the Center's medical director, has extensive experience in abuse assessments and was involved with CRESAC at another center. The KIDS Center has acted as the Western Subregional Children's Advocacy Center, providing technical assistance to centers in 5 states. (Lane Co. Child Advocacy Center in Eugene has provided specialized child abuse evaluations for 3 years and has provided extensive consultation services to other physicians in their area. Collectively, these consultation sites serve 2,150 children annually.

Referring Sites- Referral sites have varying levels of experience with information systems, but all have extensive experience in project administration and services to abused children. Josephine Child Advocacy Center and Jackson Child Advocacy Center have served child abuse victims for six years, but have consistently struggled to maintain the involvement of medical professionals. Douglas CARES has a medical provider who has stated the need for access to specialty consultation. ABC House, Lincoln Co. Child Advocacy Center, Guardian Care Center, Juliette's House, Mayer House, and Liberty House are new child abuse assessment centers. Each center has the involvement of medical providers with some experience conducting abuse examinations, but most have little or no experience interpreting colposcopic documentation. By 1998, these referral sites will serve 2,020

children annually. (See Appendix E for Number of Children Served.) While this is a small percentage of the annual number of child abuse reports in Oregon, it represents a large portion (about 85%) of those children who are referred for medical examinations. With more adequate support for medical providers, more children may be referred and seen for medical evaluations.

The composite of project participants have the experience with information infrastructure systems, project administration, serving the targeted population and collaborative history necessary to successfully complete this project.

Budget and Implementation. The scale of the proposed project will allow nine child abuse assessment centers to access expert consultation. The selected sites are in the best position to initiate the project, because their programs include medical components that provide services to the greatest number of children in the state and covers a 19 county area, therefore providing the largest impact on the targeted population. The sites are geographically dispersed, representing both urban and rural areas of the state. The population served is ethnically diverse. They also have the administrative and financial structure in place to support start-up and ongoing use of the project, and have committed to contributing the necessary financial resources for future medical consultation. It is our goal that once the project is operational and running smoothly, we will seek funds from other sources including federal grants, such as the Office of Rural Health Policy, for additional sites throughout Oregon, including individual physicians' offices in very rural communities that lack resources to support a center.

A project time line was developed to illustrate development of accounting and reporting systems, formulation and dissemination of protocols and guidelines, training, evaluation design and equipment acquisition. The project will be completed within 15 months of grant award (See Appendix F for Time line).

Because SOSCF is a state agency, application for grant funding is made pending legislative approval.

Sustainability. The expenses of this system are primarily incurred in hardware and software acquisition. Expenditures for ongoing use of this project include technical assistance, software upgrades, telephone rates and consultant fees. Project sites are committed to covering consultant fees and telephone rates in their operating budgets, with revenues coming from the CAMI Program and local fund raising efforts. The CAMI Program will continue to contribute funds as necessary to ensure project success. It is anticipated that all project sites will remain involved in the network beyond the grant period, and that additional sites will be added. The Advisory Council and ONCAAAC will continue to provide coordination beyond the grant period.

3. COMMUNITY INVOLVEMENT

Partnerships. This project involves partnerships among SOSCF, the Oregon Health Division's Advisory Council, ONCAAAC, child abuse assessment centers and medical providers across Oregon. All project sites have indicated their support, commitment and desire to be a part of this project in the accompanying letters of support. (See Appendix G.) SOSCF and the Advisory Council have committed to providing the financial and staff resources required for grant administration, technical assistance and evaluation. Three sites, CARES NW, the KIDS Center, and the Lane County Child Advocacy Center have agreed to provide medical consultation. Nine additional sites have been selected as referral sites. These sites have committed staff and financial resources needed in addition to those provided by the grant for project implementation and maintenance. This includes funds to

pay experts for consulting services. Referral sites expect to benefit from this system by gaining access to expert medical consultation. Each site will designate a site coordinator to serve as a liaison with project administrators and be responsible for obtaining local technical support and participation in project evaluation. All partners have a positive history of collaborating on a myriad of successful projects, including development of child abuse interview and medical guidelines, technical assistance, training and securing state funding for child abuse intervention. As with this project, the consulting centers have been the lead experts and helped to develop programs throughout the state.

Involvement of the Community. Multidisciplinary child abuse assessment and advocacy centers are specifically designed to promote community involvement. The need for this project was identified over a year ago, as administrators through ONCAAAC discussed issues facing their programs. Repeatedly, administrators asked for assistance to support their medical providers. A physician at CARES NW discovered the proposed software system, and asked if other centers would be interested in learning about it. Representatives from several centers participated in a software demonstration. After researching other options, ONCAAAC determined that there was a statewide need and interest in this software. Local centers were informally surveyed and indicated strong support from center staff, Multidisciplinary teams and the medical community. (See Appendix G.) These partners have been involved through project formulation and will continue through implementation.

Support For End Users. Medical providers conducting child abuse evaluations are the end users targeted by this project. They will be provided with training on how to use the equipment, and will participate in a test of the system. Each site will designate a site coordinator who will be responsible for providing physicians with technical assistance as needed. At the planned training, providers will be introduced face to face, creating a level of familiarity. The annual CARES NW Child Abuse Conference will provide examiners with hands on training in a yearly forum to keep their skills current.

An important strength of this project is that medical providers have been involved in project development and systems demonstrations, and have self-selected to be considered for project involvement, indicating their support in the attached letters. (See Appendix G.) In addition, the amount, availability and cost of technical support provided with hardware will be a factor in choosing a vendor. Additional technical support is available to some project sites, such as CARES NW and Liberty House, through their individual information system departments.

Privacy. Because this project involves transmission of medical images, security and patient confidentiality are of primary concern. In consideration of these issues, the project will use secured file format software designed to communicate with other stations running the same software. In addition, each workstation will be designated specifically for this telemedical project to deter unauthorized use. A hardware device registered to each copy of the software is placed onto the parallel port of the computer. The software can be activated only if this "key" is in place. This ensures that when the "key" is removed from the computer, unauthorized users may not activate the software. Security of each individual image is addressed by having the patient's name, social security number, date and time of image capture, and clinic ID number embedded into the image. Through proprietary coding, the original image is unalterable by any other available programs. This aids documentation and traceability of evidence. Send and receive logs are built in for tracking the transmission of each image if it is sent to another site. As a "push" system, the images may be transmitted only upon activation, thus images may not be randomly or at will extracted from the

program remotely. Paper patient files will not be created at remote consulting sites. Patient information is input at the original capture site and travels with the image when it is sent to another site. This assists in eliminating incorrect data, typographical errors and duplication of efforts.

The Advisory Council will incorporate telemedicine protocol, including security measures, into statewide medical guidelines currently under development. Project sites will be accountable for implementing the guidelines and providing the necessary staff training. Evaluation will include a component to review security once the program is established.

4. REDUCING DISPARITIES

Description and Documentation of the Disparities. The beneficiaries of this project are children who may have been abused and who live in the 20 county area to be served (*see Appendix A*). While child abuse victims come from all walks of life, statistics illustrate some general trends. *The 1995 Oregon Child Abuse and Neglect Report* cited an increase in child abuse reports over previous years, reaching an all time high of 26,765 reports. Over 8,000 children were identified as confirmed victims. Of these, 6,440 resided in communities partnering in this project, nearly half of whom did not have access to specialty medical services. Infants make up the largest single age group, and while females represent 53% of all victims, they account for 79% of sexual abuse victims. The majority of children are from families experiencing major stresses, such as unemployment, domestic violence and drug/alcohol abuse. Many children do not have private insurance and, by HUD standards, child abuse victims are considered to be low income population by definition. Currently, the percentage of patients examined at child abuse assessment centers who are covered by a public medical card ranges from 50%-93%.

Beyond reaching out to underserved abused children, the end users of this project (medical providers) come from underserved communities. As with many nonmetropolitan communities, project communities have a limited pool of medical providers and few specialty resources. Project sites have commitments of participation from general practitioners, pediatricians and pediatric nurse practitioners, who acknowledge the discrepancies in availability of expertise among themselves, and their own need for expert consultation.

Strategies for Overcoming Barriers to Access. This project directly targets the main barrier to accessing expert child abuse medical services. In the most general sense, it will bring specialized medical services into rural communities, thereby overcoming the main barrier of unavailability. However, it also addresses other underlying barriers and formulates a long-term solution. By creating a support structure among medical providers, it will reduce professional isolation and increase self-confidence. It will lend credibility to diagnoses made by medical providers at referring sites, and will increase local confidence in medical providers. This professional and community support will play a crucial role in increasing centers' capacity to attract and maintain medical providers. Ultimately, the use of expert consultation and peer review will increase the competency and specialization level of local participants, creating local experts.

The Need for Federal Support. A distinctive characteristic that makes this project innovative is the statewide collaboration of state and local governments, hospitals and community-based private, nonprofit organizations. It is this same characteristic that limits our opportunities for securing the project funds necessary to implement a cohesive program. Private foundations usually do not fund projects involving government organizations and often limit giving to a predefined geographic area. Funders targeting child abuse programs, including federal programs, prefer to fund direct patient

services and basic equipment, and do not understand the benefits this use of technology can provide in service delivery. Confronting a significant cut in property taxes, Oregon communities are incapable of financially supporting the establishment of this type of project. TIIAP funding provides an exceptional opportunity to introduce this technology to the specialty area of child abuse medical evaluation, advance the level of expertise in Oregon and demonstrate how the use of image transfer is financially feasible, user friendly and advantageous in reducing disparities in medical services available in small communities.

5. EVALUATION AND DISSEMINATION.

Evaluation Design. Use of the system will be tracked at each project site, including information on how often it was used, the number of different users and for what purpose it was used. At three month intervals, site coordinators will be surveyed to identify any unexpected costs or technical difficulties, including concerns about security or confidentiality, associated with the project. Referring medical providers will be surveyed to determine whether consultations impacted their diagnosis, their level of confidence in conducting abuse evaluations in general, and any changes they can identify in behavior due to things they've learned through consultation. All medical providers will be asked to identify strengths and weaknesses of the system, what could make the process more user friendly, what benefits they have received and if it has influenced consistency among providers. In addition, other team members will be surveyed to identify the impact of this project on investigation, prosecution and child protection. This combination of focused and open-ended questions will assist in eliciting unexpected information.

Qualifications of the Evaluation Team. To ensure a comprehensive project evaluation that will be useful for project replication, the Advisory Council will contract with an independent team to design and implement outcome and process evaluation. They will be responsible for developing specific outcome measures, coordinating data collection, and analyzing results. Several area organizations have the adequate qualifications, including The Evaluation Forum in Seattle and the Portland State University Child Welfare Partnership. As indicated in the project time line, an evaluation team with extensive experience in evaluating health care and child welfare projects will be chosen by the Advisory Council through an RFP process.

Plans for Dissemination of Project Activities. There are many forums appropriate for dissemination of project information and outcomes. In Oregon, project information will be published in the *MDT Quarterly*, a newsletter reaching professionals involved in child abuse assessment and intervention. It will be presented at CARES NW's annual training for medical providers regarding sexual abuse. Information will also be distributed to Oregon hospitals, health clinics and physicians organizations. Nationally, information will be submitted to the National Network of Child Advocacy Centers which communicates with 355 centers in 48 states through newsletters and conferences. Project outcomes may be submitted to Child Abuse and Neglect, Pediatrics, Adolescent and Pediatric Gynecology and APSAC journals. We will submit proposals for presentations at the American Professionals Society on the Abuse of Children (APSAC) National Conference and San Diego Conference on Responding to Child Maltreatment.