VIDAR Digitizers Support World Health Organization Childhood Pneumonia Studies

In many developing countries throughout the world, infant and child mortality rates are disturbingly high, and acute respiratory infections—in particular pneumonia—are a leading cause of death. As a result, preventing pneumonia is a priority, and the World Health Organization (WHO) and other healthcare institutions are studying a number of vaccines designed to protect against the disease.

The SIERRA™ *plus* Digitizer is ideally suited for use in the studies due to its unique combination of exceptional image quality, compact size, reliable performance, and affordability.

As part of its commitment to give back to the greater community, VIDAR Systems Corporation has provided its SIERRA™ *plus* Film Digitizer at a reduced cost to a number of study sites around the world in order to help them obtain the high-quality digital images they require.

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WHO Childhood Pneumonia Studies

The childhood pneumonia studies are being conducted to evaluate vaccines for bacteria that cause pneumonia, such as the *Haemophilus influenzae* type B (Hib) bacterium. A first critical step in the study process, however, was to standardize the way childhood pneumonia is diagnosed.

According to WHO, it is difficult to obtain a standard diagnosis for pneumonia because there is considerable variation in the interpretation of chest radiographs by clinicians and radiologists. In addition, the level of training and the understanding of the terminology used for describing radiological changes associated with pneumonia may vary between study investigators in different countries.

Because it was essential that the investigators agree on the terminology and techniques used to evaluate radiographs across study sites, WHO embarked on a program to standardize the interpretation of chest radiographs for the diagnosis of pneumonia in children.

VIDAR Systems Corporation, the leading manufacturer of X-ray film digitizers, is committed to providing high quality, reliable, and affordable digitizers to meet the needs of healthcare providers worldwide. The company also is committed to promoting an exchange of information that helps healthcare providers improve their delivery of care. In keeping with this philosophy, VIDAR has developed the VIDAR Case History Series to relate the experiences of healthcare organizations that have adopted its line of advanced film digitizers. For new and prospective users, these experiences illustrate how VIDAR's technology can bring quality and value to their institutions and help support the delivery of patient care.

The VIDAR Mission

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The standardized technique was developed during a series of meetings held by the WHO Pneumonia Vaccine Trial Investigators' Group, in which digital images of 200 X-rays were sent to investigators, who reviewed them and compared their results. This process resulted in the development of defined criteria for the interpretation of chest radiographs—something that had not been done before.

The childhood pneumonia vaccine trials are being conducted at a number of sites around the world—including Argentina, Australia, Chili, The Gambia, Indonesia, Mozambique, the Philippines, and Thailand—and VIDAR has provided 13 digitizers to date for use by the investigators. The study protocol calls for physicians at the local hospitals to look for cases of pneumonia in children, and those with suspected pneumonia receive a physical examination, lab tests, and an X-ray. X-rays are digitized and sent to designated study investigators for reference reading by a pediatrician and a radiologist. For example, investigators at Johns Hopkins University, a leader in childhood diseases and radiology, are working with a hospital on the remote Indonesian island of Lombok, as part of a study that began in 1998.

The physicians in Lombok manage the cases and arrange for the X-rays to be digitized. The electronic images are sent to Baltimore, where Mark Steinhoff, M.D., professor of internal health and pediatrics at Johns Hopkins, reviews the images. A radiologist completes a second, independent reading. Each case is classified into one of three categories: severe pneumonia, some other abnormality, or normal. The investigators then look at children in the severe pneumonia group, comparing those who were vaccinated with those who were not in order to evaluate the effectiveness of the vaccines.

Challenges in Obtaining High-Quality Digital Images

Obtaining the high-resolution digital images they required proved challenging for the study investigators. Initially, some of the sites used digital cameras to take pictures of X-ray film sitting on a light box. At the site in Indonesia, a commercial transparency scanner was used to digitize the X-rays. The image quality using these methods, however, often was poor.

Members of the WHO Pneumonia Vaccine Trial Investigators' Group experimented with a number of systems to digitize the images. Based on this evaluation, WHO recommended that investigators use CCD film digitizers, which provide image quality equivalent to laser digitizers but are more affordable, if their budgets permitted. During a "calibration workshop," where original films and the corresponding

SIERRA™ *plus* Digitizer

digitized images were viewed, it also was determined that the method of digitization and the settings of the digitizer could affect the quality of the image produced. As a result, WHO recommended the use of a standard test pattern with every batch of films scanned to ensure quality.

According to Brian Beardslee, vice president of VIDAR's medical business, when approached by several of the study groups about supplying digitizers for the study, VIDAR was happy to provide the digitizers at a reduced price. "The study investigators are working hard under challenging circumstances to obtain information vital to reducing deaths from childhood pneumonia," Beardslee said. "We are honored to play a role in this important research and are extremely pleased that the SIERRA *plus* Digitizer is contributing to the success of the studies. The SIERRA *plus* offers the high-quality images and reliable performance that are hallmarks of VIDAR's family of film digitizers, and its compact size and affordable price make it particularly well-suited to these studies."

SIERRA *plus* Film Digitizer

Dr. Steinhoff said the SIERRA *plus* Digitizer has positively impacted the childhood pneumonia studies for a number of reasons. He initially set up and tested the digitizer at Johns Hopkins in Baltimore, where several adjustments were made specific to the study project. Because of the digitizer's compact size, he then was able to take it with him on his next trip to Lombok, where it was set up in a workroom at the hospital. He trained a project person to run the films through the digitizer and save the files on compact disks, which are sent to Johns Hopkins for reading.

According to Dr. Steinhoff, the investigators saw an immediate improvement in image quality because the VIDAR digitizer is specially designed to scan medical X-ray film. "The SIERRA *plus* Digitizer has performed extremely well, and we are very happy with it," Dr. Steinhoff said. "Because of the remote location of the study sites, we needed a digitizer that would provide consistently reliable performance, without the need for maintenance. Yes, we could have sent it to the capital in Jakarta for service, if needed, but that would not have been practical. The SIERRA *plus* Digitizer is being used at sites that are off the beaten path, and it works just fine."

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Conclusion

The childhood pneumonia vaccine studies are a critical step in the ongoing war against pneumonia, a devastating disease that affects millions of infants and children throughout the world. Because X-rays are a fundamental part of the diagnostic process for pneumonia, a high-quality film digitizer is critical for remote diagnosis or consultation. VIDAR is pleased to have played a role in this worthy cause by providing its SIERRA *plus* Digitizers at a reduced cost to study sites around the world. The exceptional image quality provided by the digitizer, combined with its compact size and high level of reliability, has made a significant impact on the success of the studies.

As the Johns Hopkins/Lombok childhood pneumonia vaccine study nears completion, with almost 3,000 images scanned and reviewed, Dr. Steinhoff reflected on the contribution of the SIERRA *plus* Digitizer to the success of the project. "Let me just emphasize that we appreciate VIDAR's decision to work with WHO on this important project," he said. "And, in fact, technically the SIERRA *plus* Digitizer is excellent. Even in a remote setting like Lombok, Indonesia, it has worked great." ●

World Health Organization

The World Health Organization, the United Nations' specialized agency for health, was established in 1948. The organization's objective, as set out in its constitution, is the attainment by all peoples of the highest possible level of health. It is governed by the World Health Assembly, which is composed of representatives from WHO's 192 member states.

The VIDAR Family of Film Digitizers

VIDAR Systems Corporation offers a family of award winning, high-quality film digitizers designed for a variety of clinical applications. The image quality of VIDAR's digitizers has been proven in clinical studies at leading centers around the world. VIDAR's family of film digitizers serves the PACS, remote primary diagnosis, teleradiology, telemedicine, mammography, and oncology markets and has been selected by more than 100 leading systems solution providers for inclusion in their product offerings. For more information about VIDAR's medical imaging products and services, call 1-800-471-SCAN or visit www.filmdigitizer.com.

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