

## Axis network cameras take care of the little patients' safe sleep. I.Mościcki Hospital in Chorzow implements telemedicine solutions in the diagnosis of respiratory disorders using Axis products.



Organization:  
I.Mościcki Hospital

Location:  
Chorzów, Poland

Industry segment:  
Healthcare

Application:  
Patient monitoring,  
diagnostic quality  
control

### Mission

**I.Mościcki Hospital in Chorzow, Hospital for Children and Adults – Sleep Laboratory:** A private hospital whose main area of activity is otolaryngology (ear, nose and throat disorders) for adults and children. The Sleep Laboratory operating in the Hospital is a leading organization in the country in which breathing and sleeping structure disorders are diagnosed and treated. Appropriate diagnostics and, in the case of detecting disorders, quick commencement of treatment are the key factors for appropriate prevention of apnea consequences.

### Solution

Aiming at creating PSG testing quality standards in the country, the Sleep Laboratory adopted the strict guidelines of the American Sleep Academy - AASM 2008. These guidelines require registration of numerous physiological parameters, such as blood oxygen levels, heart function, brain and muscle electrical activity and video monitoring of the whole test in infrared during sleep.

The Hospital uses Philips/Respironics diagnostic stations which require the possibility of obtaining coded connection with cameras, remote steering of the camera's position as well as automatic switching of day/night modes, which quickly led to the implementation of Axis solutions.

### Result

AXIS 214 PTZ Network Cameras provided the medical personnel supervising the night testing with the possibility of non-invasive monitoring of the diagnosed patients. This is crucial because each visit to the patient's room can influence the results of the tests. Monitoring of the youngest patients allows for quick reaction of the medical personnel in the event the child awakes, as a hospital stay is always connected with stress. The video records, synchronized with the registration of physiological parameters, improve the quality of diagnostics.

Photos courtesy Mr Marcin Kawalski  
I.Mościcki Hospital in Chorzow.

"Equipping the diagnostic stations of the Sleep Laboratory with digital video metrics has improved the quality of testing and the ease of my work. As a doctor remotely analyzing the testing, I obtained the possibility of visual control of the quality of work performed by the technical personnel. The fact that the Axis cameras which we use register images in infrared connected with light optics enables me to verify breathing incidents and sleep disorders which I first mark on the physiological parameters diagrams."

Dr Maciej Tażbirek, PhD.

## Axis, the guardian of sleep

Sleep testing requires all-night observation of the patient and registration of numerous physiological parameters. The Hospital specializes in the diagnosis of night breathing disorders occurring in the youngest patients. Pre-school children are especially prone to occurrence of apnea (periods of time when normal breathing is blocked) if their tonsils enlarge. With children, the presence of apnea during sleep sometimes leads to slower intellectual development and serious behavioral and learning disorders. Alice5 diagnostic stations equipped with AXIS 214 PTZ Network Cameras as well as the video obtained from them, allow for easy elimination of measurement artefacts – for example, apnea resulting from the complete lack of airflow through the nose detector can be a result of a loosening of this sensor, which can be immediately observed thanks to the night monitoring.

Connecting brain electrical activity (EEG) with the picture from AXIS 214 PTZ cameras set on a close up of the patient's face facilitates differentiation between the REM (rapid eye movement) phase in which the patient's eyeballs move very quickly, from the records of the awakened patient.

The use of Axis cameras and enlarging the number of diagnostic stations has been performed within the framework of the IT project. The Sleep Laboratory owns a part of the main network infrastructure which needed to be expanded due to a burdening of the hospital network with the amount of generated data. An individual PSG test lasts for about 8 hours and includes registration of all physiological parameters as well as video images, and generates a 5GB file. In order to facilitate synchronization with registering physiological data, the video test records are stored directly on the hard disks of the diagnostic stations.

Capturing the raw stream data from the Axis cameras is possible thanks to API accessibility. Philips/Respironics Alice5 stations can therefore communicate with the cameras without the use of a PC. The patients' double rooms are equipped with beds for adults and children. Using the pre-programmed settings of the positions of Axis cameras, the technical personnel can set their positions depending on the bed occupied by the patient. In order to improve the picture resolution, the night cameras have been equipped with additional IR lamps.

## Security first

Medical data belongs in the category of highly sensitive data and it was therefore necessary to implement appropriate security measures. The possibility of obtaining a coded connection between all devices turned out to be necessary. The question of data security became even more important after implementation of the Axis cameras. The patients themselves started to express their concerns connected with unauthorized data leaks – for many of them publishing the fact of having serious disorders could have professional consequences – for example for drivers or pilots. While choosing the technology, the network security functions of the Axis solution provided the hospital and patients with a feeling of security and privacy.

## Improving ease of work

Due to the hospital spatial organization – bed wards are placed on two floors – it was necessary to implement remote monitoring provided by mobile devices. Using a WiFi network, tablets and an application connecting with Axis cameras (NetCamViewer) it is possible to monitor patients located on different floors.



"For a doctor dealing with sleep diagnostics, the highest added value of digital video metrics is the possibility of easy identification of measurement artefacts and, therefore, avoiding false testing results." Dr Maciej Tażbirek, PhD.

