Technical information 1.0: The Early Warning Scan

The Early Warning Scan (EWS) is an innovative breast cancer screening technique which is suitable for women of **all ages.** It is based on a combination of different computer vision techniques and artificial intelligence. The EWS cannot find tumors, but it looks for external phenomena that can indirectly indicate breast cancer such as lumps, wrinkles, discoloration and nipple irregularities. The EWS can find these many times faster than is possible with the human eye. In addition, deeper abnormalities can be found by using advanced methods to measure the elasticity of the breast tissue. Local reduction in elasticity may also be an indication for breast cancer

The EWS is many times more effective and objective than self-examination and also relieves women of the life-long psychological burden that self-examination entails.

The technique is contactless and causes no physical discomfort. Therefore scans can take place frequently. If irregularities are found, considerable time can be saved in early hospital referral. This can have a great impact on the severity and consequences of required treatment and may even be life-saving. The EWS is not a substitute for mammography: someone who is referred receives the same treatment as everyone else. It is emphatically not a diagnostic technique, but it is a substitute for self-examination.

An EWS consists of two parts:
- gathering as much information as possible from the surface of the breasts,
- interpreting this data in order to arrive at a risk assessment.

To collect data, we use advanced 3D scanning and various photographic techniques. This creates accurate surface and color information of the breasts. For the processing and interpretation of this information, we use multiple techniques and algorithms to arrive at the most objective and reliable prediction possible.

The EWS has significance on several levels:

Level 1 - individual: even at the first scan, valuable information can be discovered by comparing both breasts. Patterns found in one breast but not in the other are the first indication that something may be wrong.

Level 2 – individual: If a woman undergoes a six-monthly or annual scan, a good picture of any slowly developing phenomena such as nipple deformation or increase in asymmetry of the breasts is built up. Both are indications of the possible presence of breast cancer.

Level 3 – collective: By applying self-learning algorithms, large numbers of scans from both healthy and sick women can be analyzed. With the help of artificial intelligence, the distinction can then be made between healthy and unhealthy tissue .

Level 4 – collectively: by analyzing the breast development of many women over many years, we aim to find patterns that provide fundamental insight into the influence of pregnancy, menopause or other invasive physical processes on the development of breast cancer.

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