A small step for AI, a big step for premature newborns: Digi-NewB first system demonstration now operational

Three years after the start of the Digi-NewB project, the Digi-NewB European consortium is now ready to show a first demonstration of the AI-based sepsis risk decision-support system. First sepsis risk scores were successfully obtained during a 12h-recording of a premature newborn at Rennes Hospital. This new generation monitoring system aims to save lives and improve health and care for the 300 000 babies born prematurely each year in Europe.

Digi-NewB decision-support system aims at guiding clinicians in better assessing the sepsis risk in a quantified, real-time, non-invasive manner. The system is based on three key steps: capturing a full set of data from the newborn (vital signs monitoring, clinical observations, movements thanks to video recordings), treating and analyzing them and displaying a newborn sepsis risk score. With this new system, clinicians can view a sepsis risk score evolution in time, view selected parameters trends, and replay video recordings for any given time. The system is easy to use and install, thanks to usability studies held in several hospitals with care staffs.

 "We are often 'too late' when we detect sepsis, at the peak of clinical signs. Each hour we can gain is an expected benefit for the patient. With our approach we both want to demonstrate that we can early detect sepsis several hours to days before and be more specific than usual practice" says Pr. Pladys, Digi-NewB Scientific coordinator. Both parents and care staff have high expectations on this new system, that was conceived to be easily interoperable with existing EHR systems.

 "This system, even perfectible, is the concretization of several years of research around the cardiac variability and the respiratory variability led by the laboratory. Beyond the demonstration, this system is the crossroads of several key scientific domains Big Data, IA, modeling, database management at the heart of the laboratory's themes" emphasizes Pr. Carrault, from the Image and Signal processing laboratory of Rennes 1 University, partner in Digi-NewB.

As emphasized by a mother of a newborn hospitalized in Rennes hospital, *"monitoring sepsis risk is important, and access by carers to video monitoring is very reassuring for us"*.

The project is based on a shared health data platform including more than 400 newborns from the HUGOPEREN network, with an objective to monitor more than 700 until the end of the project. Philippe El Saïr, GCS HUGO administrator, is proud of this success: *"Digi-NewB is the first european project coordinated by a healthcare cooperation group. This success not only highlights the strengths of the HUGO teams, but it also demonstrates that synergies and complementarities make us more competitive at an international level, as far as research is concerned. Indeed, HUGO pediatricians' network allowed us to reach the critical mass with clinical trials, thanks to the mobilization of experienced investigators."*

The system was developed by a European consortium made of 7 academic and industrial partners funded by the EU H2020 research and innovation program. These partners collaborate with the GCS HUGO network, Rennes Hospital and Rennes 1 University to bring their competences in user-centered design (NUIG, Ireland), Artificial intelligence models (TUNI, Finland), complexity indexes (INESC TEC, Portugal), hardware development and sound analysis (Voxygen, France) and innovative hospital information systems (Syncrophi, Ireland). Data is collected in the 6 Western Hospitals (Rennes, Angers, Brest, Nantes, Tours, Poitiers) thanks to the agreement of parents of newborns hospitalized in neonatal units. Partners will actively work until the project end to improve the selected decision models, improve their specificity and develop a new maturation monitoring model. The project will end in February 2020 and the aim is to validate the approach on more than 1000

patients, by including more hospital centers. A final event will be organized to present the results. Stay tuned!

More information on the project :

- Site web : www.digi-newb.eu
- Project promotional video link
- Funder : EU H2020 research and innovation program