"Neo100 provides me with information to optimize resuscitation, especially in difficult cases. Particularly when there is a need for high pressure, e.g., with meconium-aspirated newborns, the Neo100 gives extra information that can help save the baby's life"

DR ANNE MARIE KEUS

Pediatrician and Neonatologist at Alrijne Hospital, Leiden, The Netherlands.

Alrijne Hospital is a regional hospital located in the West of the Netherlands, near several larger cities with academic hospitals.

The Netherlands has a long tradition of home births, with the highest proportion in the Western world. About 14 percent of Dutch women give birth at home, while another 13 percent give birth with their own midwife in birth centre located in hospitals. Approximately 60 percent give birth in hospitals, primarily for medical reasons.

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Pediatrician and Neonatologist
at Alrijne Hospital, Leiden, The Netherlands.

Dr. Anne Marie Keus has been working as a pediatrician and neonatologist at Alrijne Hospital since 2021, where she is responsible for the neonatal department. She has also worked for seven years at the nearby Leiden University Medical Center, as well as for three years at Haga Ziekenhuis, and spent two years in Sierra Leone where she was medical officer in charge at Masanga Hospital.

Strong tradition of home births

Over the past 10 years, there has been a slight increase in the number of first-time mothers who choose to give birth in a hospital. Alrijne Hospital handles about 1,750 deliveries annually, which are divided between medical births, where obstetricians and midwives working at Alrijne participate and outpatient deliveries, where pregnant women choose to give birth at the hospital instead of at home. During outpatient deliveries, midwives who typically work outside the hospital are responsible for the birth, with the help of a hospital-based delivery nurse. If complications arise, the midwife can access additional resources from hospital healthcare staff and consult or hand over care to pediatricians, midwives, and gynecologists during the delivery if necessary.

"I really like Neo100. The system provides me with information to optimize resuscitation, especially in difficult cases. Particularly when there is need for higher pressure, for example with meconium-aspirated newborns, I get extra information that could save the baby's life."

Integration of Neo100

Dr. Keus explains that the hospital has access to two Neo100 systems. Adjacent to the delivery rooms, there is a resuscitation room equipped with a resuscitation table where a Neo100 system is mounted along with all necessary neonatal resuscitation equipment. A similar resuscitation room is located next to the operating room, where a Neo100 system is ready to be used after birth by cesarean section, should complications arise with the newborn.

"It is a great and simple system which provides me with useful information when I receive a newborn with breathing difficulties. The Neo100 monitor shows all the necessary ventilation parameters I need to optimize resuscitation. Everything is very accessible and easy to use," says Dr. Keus.

There was a somewhat longer startup period before Neo100 began to be used more regularly. Initially, the system was used mainly when Dr Keus or one of the other neonatologists were present. Almost every time she used Neo100, Dr Keus could make adjustments to the parameters – either increasing or decreasing pressures, based on the information the system provided. Delivery nurses noted that Neo100 often led to a change in the resuscitation process. During debriefing after the newborn had left the room, Dr Keus always taught them what she had observed, what actions she had taken, why she did it, and the effect it had on the outcome.

"When it comes to newborn resuscitation, it is mainly the delivery nurses who are most often first responders to the situation, followed by neonatal nurses, junior doctors, and then pediatricians. The delivery nurse is always present at the birth and is often the first to notice if the baby is not breathing as it should. In most cases, they start ventilation and continue until the neonatologist arrives. After some time using Neo100, it was actually the midwives and delivery nurses who started reminding pediatricians to use the system. I believe this is because, in our setting, they are the ones who see the most resuscitations and perceive a difference in the intervention when Neo100 is used compared to when it is not", says Dr Keus.

"If I have a newborn with meconium aspiration and has serious problems with respiration and circulation, Neo100 is very helpful. It gives me the extra information I need to improve the intervention. It provides immediate feedback that helps me make more precise decisions during resuscitation"

That extra valuable piece of information

Dr Keus continues: "I really like Neo100. Without the system, – for example, with a meconium-aspirated newborn with respiratory insufficiency or resuscitation without an improving heartbeat. In such situations, there might be a need to increase the pressure. With Neo100, I get concrete numbers of given PEEP/ PIP and tidal volume, which makes the resuscitation both safer and more accurate. Especially in cases with meconium aspiration, the system provides great value. But also in less acute situations – when Neo100 shows that given tidal volume is good, there's no leakage, and the ventilation rate is correct – then I am reassured resuscitation is done as it should. This extra information allows me to give more responsibility during resuscitations to my junior doctors and nurses and teach them without taking over the

ventilation. Neo100 provides security in a critical situation."

Key Benefits of Neo100

"I use all the parameters and particularly benefit from the volumes – that's what I mainly use to adjust my respiratory support. It's also valuable to keep track of PIP and PEEP. Especially when I observe someone else's resuscitation, such as a junior doctor, I often look at leakage. This allows me to give direct feedback, like suggesting they first focus on reducing leakage before we move on to discuss pressure and volumes. The frequency is certainly interesting, but not the most important parameter for me. First, I want to make sure the other parameters are optimized. I observe the chest movements and sounds and compare them with what the monitor shows to ensure everything looks good. When I see the parameters are correct, I primarily focus on the sensor module. If it shows a color change, I know it's time to look up at the screen again. This gives me a quick and secure workflow."

"I really appreciate the simplicity of Neo100 – both in terms of the user interface and the setup. I'm used working with advanced monitors full of flow curves and graphs, but I believe too much information on the screen can become a distraction. The more parameters you have to interpret – especially without specific training – the greater the risk of missing something important. Neo100 is clear and stripped-down, with large, easy-to-read numbers and an intuitive layout. I especially like the volume bar that shows how much air is actually going into the lungs."

Clinical situations - Neo100 in difficult cases

It's a system that's easy to understand. Simple setup, no unnecessary colors, no wildly fluctuating values – just what you need, presented in a clear way. Neo100 has been particularly helpful in cases of meconium aspiration and asphyxia, when it's difficult to stabilize the baby. At least I can rule out that ventilation is inadequate – I get visual feedback that air is entering the lungs, the volumes are adequate, the frequency is okay, and there's no leakage."

"In difficult cases, when you're trying to piece together what's wrong with the newborn, having that extra information is invaluable. It gives me confidence that the ventilation is working as it should – that the intervention is adequate for the moment. For this reason, Neo100 is particularly useful for me in two types of situations: in cases of meconium aspiration and in cases of severe asphyxia.", Dr Keus concludes.

About Alrijne Hospital

Alrijne Hospital, located in Leiden, is a leading healthcare provider in the Netherlands, committed to delivering high-quality medical services to its community. The hospital's mission is centered around patient care, innovation, and collaboration.

Alrijne Hospital offers a wide range of medical specialties and services, including general medical care, specialized treatments, and advanced diagnostics. Their dedicated team of healthcare professionals works together to ensure the best possible outcomes for patients, reflecting a commitment to excellence and patient-centered care.

The hospital has six delivery rooms, a maternity ward where mothers and their newborns stay before discharge, as well as a pediatric department and a neonatal unit with capacity for eight newborns who need extra care like antibiotics, monitoring, and respiratory support.

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