



Photographer: Rikka Myöhänen, KUH

Case Report

Announcing a quiet revolution in Neonatal Intensive Care

How an Ascom alert-handling solution is helping to provide ‘family-centered’ Neonatal Intensive Care—a fresh departure in NICU practice that can contribute to improved clinical outcomes, better parental bonding, and reduced lengths of stay.

“Parents learn to love their baby earlier. That’s the best result.”

MILA HILDEN

The outside of the new ‘Kaari’ complex at Kuopio University Hospital (KUH) is breathtaking. But it’s what goes on inside the five-story, 32,000 square-meter building that’s truly inspiring. For it’s here, among the lakes and pine forests of central Finland, that a Neonatal Intensive Care Unit (NICU) is using a pioneering family-centered approach to radically improve care outcomes for newborns and infants. Put simply, the concept involves keeping children and parents together in ‘family rooms’.

“The concept certainly involves some very impressive technology,” says Senior Nurse Mila Hilden, gesturing to the NICU’s array of monitors and incubators. “But what we’re doing is actually pretty straightforward: providing an environment where babies and their parents can spend as much undisturbed time together as possible—and where the atmosphere approximates that of a loving, nurturing home.”

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“Our resources
are better utilized.”

MILA HILDEN



Photographer: Fredrik Andersson, Ascom

Mila Hilden, Senior Nurse at the new NICU at Kuopio University Hospital in Finland. A veteran in ICU medicine, Hilden was a project manager helping to select and evaluate the NICU's wireless communications and alarm notifications solution.

Reducing noise levels—why it's important

- Excessive auditory stimulation creates negative physiologic responses such as apnea and fluctuations in heart rate, blood pressure, and oxygen saturation.¹
- The physical and psychological Neonatal Intensive Care Unit (NICU) environment may be the single most important factor in neonatal development...exposure to light and noise may cause physiological stress on infants that increases their length of stay in the NICU and ultimately decreases cognitive development.²
- The premature infant does not have the developmental capacity to endure environmental stresses the way a full term infant might.³

Creating such an environment is hard work. But the benefits are worth it. “Having a baby and parents together in one room has tremendous therapeutic benefits,” says Hilden. “Infection rates are lower than with conventional group spaces. Breastfeeding success rates are higher. The length of stay prior to transfer to a general ward or discharge is shorter. And it really helps parents bond with their babies.”

Planning for the new NICU began in earnest in 2008. Ascom became involved in 2014, and despite entering the project at a relatively late stage, both parties were soon speaking the same language. “Ascom's technical skills and track record were of course important,” says Hilden. “But just as important was Ascom's enthusiasm for Healthcare—how, for example, it has staff with clinical backgrounds who really understand nurses' daily realities.”

The project team knew from the start that the new NICU's incubators would have sophisticated monitoring systems to produce alarms whenever any critical values were exceeded. The team also faced a major patient-alert management hurdle. Hilden explains: “It's obviously impossible to have a single nurse continuously monitor one room. At the same time, it is vital to keep the NICU quiet, as newborns are extremely sensitive to noise disturbances. Even ambient noise that most of us consider low-level can have serious adverse effects on newborns, particularly premature infants. This need for minimal disturbance ruled out traditional systems featuring audio-visual and unfiltered alerts.”

In fact, it quickly became clear to the project team that the family-room approach would not be possible without some sort of secondary alarm notifications system to enable nurse mobility. “The more we examined the challenges,” says Hilden, “the more it became apparent that a reliable mobility solution with filtered alerts would be essential to the entire project. It also became apparent that Ascom was the only vendor that could deliver such a solution.”

Smooth re-calibration

The new NICU at KUH—complete with Ascom Myco smartphones, Ascom Innova nurse call, and an Ascom Unite alarm notification solution—opened in May, 2015.

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KUH NICU at a glance

- 2,500 births per year
- New state-of-the-art NICU opened in May 2015
- 18 family rooms in NICU
- 10-12 nurses on duty during typical shift

Benefits of the Ascom solution

- Easier and faster bonding between parents and babies
- Peace of mind for nurses—job satisfaction
- Better utilization of existing resources
- Faster turnaround time—babies and families can go home earlier

The Ascom solution at KUH NICU

- Ascom Myco purpose-built healthcare smartphones
- Unite Messaging suite including:
 - Unite Connectivity Manager for managing hospital users and devices
 - Ascom Cardiomax for patient monitor integration
 - Unite Assign for nurse assignments
- Ascom Innova Nursecall



The new and colorful Kaari medical complex houses an NICU, a Maternity Ward, a Gynecology Outpatient Clinic, and a Breast Milk Center. There are also large Surgical and Anesthesia Units, as well as a Kidney Outpatient Clinic and a Dialysis Unit.

The 18 family rooms quickly filled with premature newborns and under-ones recovering from serious illnesses and surgery.

“We thought we had the complete solution,” remembers Hilden. “We retained our traditional monitoring systems that broadcast audio-visual alerts to the ward— alerting all caregivers whenever an infant’s critical values exceed safe parameters.” The NICU also had Ascom Unite – a smart middleware platform that integrates the nurse call and patient monitoring systems directly to the handsets carried by nurses—essentially helping to mobilize their workflows. “It could,” says Hilden, “be integrated with various alarm sources to distribute alerts to nurses on the go.”

The NICU nurses initially asked that the new Ascom solution be configured, with virtually all alerts going unfiltered to their Ascom Myco smartphones. “We’re nurses,” explains Hilden. “We naturally want to know as much as we can about each patient under our care. Moreover, we believed that enabling unfiltered alerts would help us be more proactive—would let us see patterns so we could better predict when to attend to an infant.

But having unfiltered alerts proved almost as bad as having nothing at all. “The Ascom team had warned us,” says Hilden. “They said our nurses could be overwhelmed by a high frequency of clinically insignificant alerts. And they were right. Each on-duty nurse was soon receiving hundreds of alerts during a shift. We were being swamped.”

Another drawback of unfiltered alerts is the potential for ‘alarm fatigue’. This serious phenomenon occurs when caregivers are desensitized by excessive exposure to alerts and alarms. Alerts blend into a kind of ‘white noise’, and caregivers may just not hear or notice an alarm notification. There have even been cases of caregivers disabling monitors and alarm systems in order to escape incessant disturbances.

Ascom of course swiftly addressed the issue, and calibrated the solution. Hilden points out it was actually a valuable experience. “It showed the solution could reliably communicate alerts based on extremely wide parameters of physiological data. And it proved we could quickly customize the system to what is just right for us.”

Benefits for moms and midwives, too

The solution at KUH NICU incorporates the flexible 'Unite Assign' staff-assignment and event-handling application. Unique features make it possible for new mothers who are themselves patients at the adjacent women's ward (usually for 2-5 days after giving birth) to actually remain at the NICU in close physical contact with their babies. These mothers' assigned midwives remain on duty at the women's ward, but receive alerts from the mothers.

The capability of Unite to differentiate between mothers who are also patients, and those who are solely mothers is cited as a major factor in the success of the Ascom solution at the NICU. It was essential that alerts from mother patients go direct to the women's ward, and that those from infants go direct to NICU nurses.

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MILA HILDEN



Photographer: Riikka Myöhänen, KUH

The family-centered care made possible by the Ascom solution means parents have the time, space, and quiet they need to bond with their babies.

No child left behind

According to Hilden, the NICU's nurses are still discovering unforeseen advantages with their new alert-management solution. Take 'Unite Assign', for example, a module within Ascom Unite middleware that simplifies the assignment of nurses to patients. It can also be used to define escalation chains for alert notifications. If no one is assigned, or no one in the escalation chain responds in a timely manner, the alert is broadcast to all. This helps to ensure alerts do not go unattended and has emerged as something especially valued by the NICU's nurses.

"Peace of mind is a cornerstone of nursing," says Hilden. "A nurse can't perform properly if she or he is worrying that a patient somehow or somewhere has slipped through the system, and that alerts are going unanswered. Ascom's Unite Assign helps eliminate such worries. We know that each alert will be escalated along an assigned chain of nurses. And we know the solution will automatically broadcast an alert to all nurses should it not be attended to within the appropriate time. Now, this might sound like a technical detail to most people. But as any nurse will tell you, such knowledge is invaluable—it helps us focus on delivering the best care we can."

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2. Brown, G. 'NICU Noise and the preterm infant' *Neonatal Network*, 2009 May-June: 28 (3): 165-73. available from: <<http://www.ncbi.nlm.nih.gov/pubmed/19451078>> [08 January 2016]
3. McGrath, J., Lutes, L., Kenner, C., Lott, J., & Strodtbeck, F. (2002). 'Developmental care: Acceptable or not'. *Newborn and Infant Nursing Reviews*, Volume 2, Issue 1, 46-48

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