



## IMPROVING OUTCOMES IN THE NICU THROUGH WEB-ENABLED VIRTUAL ENGAGEMENT TOOLS FOR PARENTS AND FAMILIES

Mitigating potential harm caused by physical  
separation of neonates and their parents

VIRTUAL ACCESS IN THE NICU IS VIRTUAL CARE



## TEN PERCENT OF ALL NEWBORNS ARE PREMATURE AND ONE IN EIGHT IS CONSIDERED “PRETERM.”

Ten percent of all newborns are premature and one in eight is considered “preterm,” meaning they were born before 37 weeks of pregnancy.<sup>1</sup> While technology has greatly improved the chances of these fragile patients living a full, healthy life, it often results in longer stays in the Neonatal Intensive Care Unit (NICU), which increases separation of infants from their parents and family.

The experience of having a baby is one typically filled with excitement and joy for parents and families. When the baby is premature, preterm, or born with significant health conditions, those emotions are met with equal or greater anxiety. This dichotomy of emotions causes enormous stress on parents and is further amplified through the physical separation that comes when babies have to spend weeks or months in a NICU. This can be especially difficult for parents who live in rural areas where travel to and from the hospital can be problematic, or for parents who are deployed in the armed services. Mothers who have been hospitalized after delivery can find it difficult as well, even if they are in the same facility. Hospitals and health systems need to look for new ways to reduce this separation and mitigate the potential for reduced outcomes that it can cause.

## THE CLINICAL IMPORTANCE OF PARENTAL ENGAGEMENT

The idea that involving families in a patient’s care can help improve outcomes is widely accepted as a critical aspect of care in the NICU.<sup>2</sup> Research indicates greater parental involvement results in reduced length of stay, decreased readmissions, and improved outcomes.<sup>3</sup> New research from The Beryl Institute indicates a growing focus on improving the parent-patient-provider experience in the NICU. The organization conducted a focus group with NICU caregivers from a variety of diverse healthcare organizations, along with patient-experience experts and parents who have had infants in a NICU.<sup>4</sup> The study found broad agreement among participants.



## PERCEIVED VALUE OF THE PATIENT-PARENT EXPERIENCE IN THE NEONATAL ENVIRONMENT

41.17%

Believe unit leadership must establish and implement a formal definition of patient experience shared by all in the unit

80.58%

Believe integrating families into their baby's care is very important

75.73%

Believe training families to become meaningful advocates for their baby is important

71.84%

Believe helping parents become confident, knowledgeable caregivers is important

The research also found a desire for technologies that extend the boundaries of NICU care outside the hospital walls. One specific technology gaining traction is the web camera. While the technology has been in use for a number of years, advancements in functionality have brought more interactive features that deliver even greater value in driving outcomes for critical care areas such as the NICU.

## VIRTUAL CARE ENGAGEMENT - TELEHEALTH

A 2017 survey of healthcare professionals indicates escalating adoption of telehealth as an effective form of care delivery.<sup>5</sup> The research found 75% of healthcare organizations in the U.S. and Canada are currently investing in telehealth technology. Sixty percent noted "improvements in efficiency, timeliness of care, ROI and patient health." The same study found satisfaction scores to be especially high for video-enabled solutions: 83% for virtual visits, 84% for acute care management, and 90% for chronic health support.

### ADOPTION OF TELEHEALTH TECHNOLOGY

**75%** Healthcare organizations investing in telehealth

**60%** Have seen improvements in efficiency, timeliness of care, ROI and patient health

**83%** Satisfaction score for virtual visits

**84%** Satisfaction score for acute care management

As part of the adoption of telehealth, bedside web cameras have become a welcome resource, especially for rural parents of NICU patients who lack the option of frequent in-person visits. Clinicians also recognize the technology's importance for improving parental and family involvement in the NICU environment. Evidence now shows that babies who have exposure to maternal sounds in the NICU do better than those that do not. One such study found a decrease in cardiorespiratory events during maternal sound stimulation in relation to routine hospital sounds.<sup>6</sup> The benefit was even most significant for babies at or greater than 33 weeks gestation, highlighting a potential opportunity window "when the infant's auditory brain development is most intact."<sup>7</sup>

Another study found that increasing the amount of parent talk with preterm babies in the NICU resulted in higher 7- and 18-month language and cognitive scores.<sup>8</sup> Yet another study found "Exposure to parental talk was a significantly stronger predictor of infant vocalizations at 32 weeks and conversational turns at 32 and 36 weeks than language from other adults."<sup>9</sup>

**"EXPOSURE TO PARENTAL TALK WAS A SIGNIFICANTLY STRONGER PREDICTOR OF INFANT VOCALIZATIONS AT 32 WEEKS AND CONVERSATIONAL TURNS AT 32 AND 36 WEEKS THAN LANGUAGE FROM OTHER ADULTS."<sup>10</sup>**

## MITIGATING THE CLINICAL IMPACT OF PARENTAL STRESS

In addition to parent talk, parental stress has been found to influence clinical outcomes in the NICU. Multiple studies have linked postpartum maternal distress to adverse cognitive, behavioral, and psychomotor development of the infant.<sup>11,12</sup> Although most parents prefer to be with their neonate in person, research has found that those who have access to web cameras express a sense of relief by being able to view their baby at any time from any web-enabled device. They also feel it helps keep them better informed and confirms that what the doctors are telling them is correct.<sup>13</sup>

Research by AngelEye Health further corroborates the research particular to the neonatal environment. AngelEye is a

leading provider of virtual engagement solutions for NICUs, PICUs, ICUs, surgery and other departments. In one study, the company's web camera solution was implemented in a rural area of the U.S. with the state's only academic medical center. At the time, the camera technology allowed for visual viewing and one-way audio from the parent to the infant. Up to 20 family and friends were able to view the infant at the same time, 24 hours a day, seven days a week. Evaluation of the program after 11 months resulted in an average parental satisfaction score of 4.75 out of 5 (5 indicating "mostly satisfied").<sup>14</sup> Ongoing surveys indicate parents and families using AngelEye experience greatly decreased emotional stress and anxiety.<sup>15</sup>

**"ANGELEYE GIVES US CONFIDENCE. INSTEAD OF CALLING EVERY FEW HOURS TO CHECK IN, WE ONLY CALL ONCE A DAY. WHEN WE LOG IN AND SEE THAT SHE'S SMILING, IT MAKES OUR DAY AND RELIEVES SOME OF OUR ANXIETY."**





“The first time I saw my baby boy was via AngelEye after he was born via emergency C-section at 24 weeks. It was always comforting being able to log in to see him when I wasn't physically able to be with him. I am forever thankful for AngelEye because of this.”

“I was scared to leave my daughter in the NICU at first, but the AngelEye Camera really helped my anxiety. It makes it a lot better being away from her because I can always check in and see what she is doing.”

Since the first implementation, AngelEye features and functionality have expanded to include multiple, interactive communication options for patients, parents, families and clinicians, as well as NICU workflow solutions for better clinical efficiencies.

## VIDEO-ENABLED ROUNDING

In addition to expanded access and improved parent-infant bonding, technology such as AngelEye can be used to improve care collaboration and communication among clinicians and parents throughout the continuum of care. For example, the AngelEye Clinical Communication application on its Virtual Care Platform was designed by clinicians with a focus on customizable workflow integration for each department.

“The system has been embraced and adopted seamlessly by our nursing and medical staff. They have seen first-hand the positive effects of the system on the family's emotional well-being.”

- Jennifer Flippin, RN, BSN, RNC-NIC

NICU NURSE MANAGER, UNIVERSITY OF NORTH CAROLINA HOSPITALS

With multiple communication channels, AngelEye streamlines and simplifies consistent information exchange. Clinicians can use the technology to record videos during daily rounds, which reduces the need to manage silos of information. It also increases the efficiency and effectiveness of patient hand-offs from one clinician to the next, helping to reduce gaps in care. Virtual rounding videos also provide an opportunity to proactively communicate with parents and family members to keep them informed on their neonate's progress. Clinicians benefit through reduced phone calls into the NICU, allowing them to spend more time on direct patient care. In addition to rounding videos, AngelEye enables clinicians to send parents status updates based on their preferred method of communication, including pictures and text. Parents receive push notifications to let them know they have received a new communication. Additional features of the app include family message boards and language translation via Google Translate and two-way communication for better engagement between clinicians, patients and the family.



**ANGELEYE IMPROVES  
THE PATIENT EXPERIENCE,  
ALLOWING FOR INCREASED  
HCAHPS SCORES.**

## PARENT EDUCATION

One of the key elements of most hospitals' quality initiatives is greater access to educational information for patients and their families. This is especially critical for parents of neonates who often have ongoing and complex care needs. The Education application allows hospitals to easily share both video-based educational information and documentation customized to the baby's condition or to a specific hospital unit.

Application features include:

- Pre-recorded "how to" videos
- Customized training information
- Post-discharge access to educational resources and videos
- Interactive clinical and parent communication
- 24/7 viewing access
- Record of views

"It's hard to believe that I'm looking at my daughter from 7,000 miles away in Kuwait, just watching her moving. It can't get any better. I absolutely love it."

- **Sergeant Sam Last**

PARENT AND ANGELEYE USER

"Our parents rave about this offering and it has actually drawn some families to our unit specifically because we offer this technology."

- **Jennifer Flippin, NICU Nurse Manager**

UNC HEALTH

## ADMINISTRATIVE FLEXIBILITY

AngelEye solutions were designed for flexibility and ease of use. Staff can view all cameras on a single screen or choose to show only a select few. The LCD Confidence Monitoring system makes camera positioning easy without having to log in to verify. With AngelEye, hospitals can designate specific viewing times or make access available 24/7. And when greater privacy is needed, the camera can be turned off at the bedside with a simple switch.

Additional administrative features include:

- Bed Management system integration via ADT HL7 transaction, automating transfer and discharge
- Usage reports
- Easy parent account creation for staff and role-based management for families
- Patient satisfaction surveys
- Links to hospital foundations for easy contributions (Includes donor recognition)



**ADOPTION OF ANGELEYE HAS GROWN TO APPROXIMATELY 100 HOSPITALS NATIONWIDE WITH 2,000+ DEPLOYED CAMERAS, 15,000+ PARENT USERS, AND 30,000+ FAMILY USERS ANNUALLY. THERE HAVE BEEN MORE THAN 2 MILLION ANNUAL CAMERA VIEWS REACHING OVER 100,000 HOURS OF VIEWING TIME.**

## A CALL TO ACTION

The birth of a child is one of life's most joyful events. When the infant suffers from life-threatening conditions, that joy can give way to anxiety, fear, and distress. Adding the element of physical separation between the parent and child exponentially increases these emotions and potentially harms health outcomes. Technology solutions such as AngelEye allows parents to better engage with their infant even when they cannot be there in person. Virtual communication features such as rounding videos, interactive text and family message boards help keep parents informed of the baby's progress. And online access to educational materials improves the quality of post-discharge care.

Improving the care experience and increasing outcomes for the baby is the priority for all hospitals. As technological advancements continue to elevate the long-term prognosis for neonates to live full, healthy lives, hospitals need to ensure they are supporting those advancements with virtual technology to improve parent and family engagement throughout the continuum.



<sup>1</sup> <https://www.cdc.gov/features/prematurebirth/index.html>

<sup>2</sup> <https://www.ahrq.gov/professionals/systems/hospital/engagingfamilies/guide.html>

<sup>3</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4119144/>

<sup>4</sup> <https://www.theberylinstitute.org/store/ViewProduct.aspx?id=13619118>

<sup>5</sup> <https://www.managedhealthcareexecutive.com/telemedicine/five-ways-prioritize-telehealth>

<sup>6</sup> <https://doi.org/10.3109/14767058.2011.648237>

<sup>7</sup> <https://doi.org/10.3109/14767058.2011.648237>

<sup>8</sup> <http://pediatrics.aappublications.org/content/133/3/e578>

<sup>9</sup> <https://pediatrics.aappublications.org/content/128/5/910>

<sup>10</sup> <https://pediatrics.aappublications.org/content/128/5/910>

<sup>11</sup> <https://link.springer.com/article/10.1007%2Fs10578-012-0291-4>

<sup>12</sup> <https://link.springer.com/article/10.1007%2Fs00737-014-0445-4>

<sup>13</sup> <https://www.sciencedirect.com/science/article/pii/S1527336915000902?via%3Dihub>

<sup>14</sup> <http://www.aannet.org/initiatives/edge-runners/profiles/edge-runners--angel-eye-web-camera-system>

<sup>15</sup> *ibid.*