Ethics in Radiological Practice:
The Story Behind the Image[1]

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In an era when new technologies and demands for increased clinical productivity have rendered direct contact between radiologists and patients less frequent than ever, it is important for radiologists to pause from time to time and consider the relationship between radiologic iages and the lives of the patients they depict.

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Radiology is an image-based medical specialty, and in many ways, the most salient reality in a radiologist's daily practice is the medical image. By whatever modality we produce images, they are the principal objects of a radiologist's attention. We are educated and contribute to patient care largely in terms of our ability to create high-quality images, detect lesions, offer differential diagnoses, and make recommendations for further diagnostic evaluation. Yet there is a reality behind the images, that of the patient whose anatomy and physiology they depict. If radiologists lose sight of the connection between radiologic images and the afflicted human beings they depict, our level of professional commitment and fulfillment may suffer (1).

Because the image does not tell the whole story about the human being it represents, the story behind the image can be as illuminating as the image itself (2). In an era when new technologies and demands for increased clinical productivity are rendering direct contact between radiologists and patients less frequent than ever, it is important for radiologists to pause from time to time to consider the relationship between what we see in radiologic images and the significance of those same images to patients. To explore this relationship, we describe a particular clinical case from the neonatal intensive care unit (NICU) that juxtaposes these sometimes widely separate domains of meaning.

THE CLINICAL PICTURE

Following unremitting labor, baby Grace was delivered by emergent cesarean section at 24 weeks' gestation. Prior to delivery, the neonatologist gave her parents the option of resuscitating their daughter at delivery, informing them that there was a 30%–50% chance of survival if the fetus was delivered at 24 weeks. He counseled the parents that Grace could develop severe mental and/or physical disabilities, but might also lead a normal life. The neonatologist made it clear to the parents that the management plan could be altered to less aggressive interventions or even strictly palliative care, if the situation warranted. The parents opted for resuscitation.

Grace was received by the neonatology team immediately upon delivery. She was intubated and given surfactant. Her Apgar scores were 5, 5, and 6 at 1, 5, and 10 minutes, respectively, and she weighed 830 g. The first 4 days of her life were a medical roller coaster ride. On day 1 she was started on total parenteral nutrition and received a blood transfusion. Over the next several days her medical team struggled to stabilize her respiratory status,

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switching back and forth between conventional and oscillating ventilatory support. They encountered episodes of metabolic and respiratory acidosis, the development of pulmonary interstitial emphysema, and fluctuating blood pressures. A chest radiograph report from day 4 of life read:

> Lines and tubes are in stable, standard position. No pneumothorax or pleural effusion are present. Persistent premature lung disease. Bubbly cystic lucencies bilaterally suggesting pulmonary interstitial emphysema. Impression: Interval development of findings suggestive of pulmonary interstitial emphysema.

Grace's first enteric feed was attempted on day 4, and seemed to go smoothly. Grace had not shown any clinical signs of interventricular hemorrhage (IVH). The neonatologist informed the family that because no hemorrhage had yet occurred, the probability of subsequent hemorrhage was diminishing, although the risk would persist through at least the first week of life (3). On the night of the fourth day of life, Grace's hematocrit dropped from 45 to 27. On the morning of day 5, the hematocrit had fallen still further, despite an overnight transfusion. A head ultrasound examination was performed. The report of the examination read:

> Clinical History: 24 week premature infant with probable germinal matrix hemorrhage. Comparison: None. Findings: There are very large bilateral grade IV germinal matrix hemorrhages. Both lateral ventricles are enlarged, the left more so than the right, producing some midline shift anteriorly to the right. The third and fourth ventricles are not well seen, although they do not appear enlarged. Impression: Very large bilateral grade 4 germinal matrix hemorrhages.

A follow-up head ultrasound examination was performed 3 days later and confirmed bilateral grade IV IVH, which had worsened slightly.

THE STORY BEHIND THE IMAGE

What we see in a radiology report or even a patient's chart is often but a superficial view of a deeper human reality, analogous to the difference between reading the box scores and actually attending or even playing in a baseball game. The box score reader knows only the statistical outcomes of the game. The spectator actually sees the game unfold. The player enjoys a still deeper understanding of what takes place on the field. These distinctions are perhaps never clearer in medicine than when one person is both the physician and the patient/family member. One of the authors of this article did not simply read a patient's chart or even participate as a physician in caring for the patient. One of us (P.M.) was the husband/father of the patient in this case. The rest of the story is told from his perspective.

HARD CHOICES

Our experience in the NICU was similar to that of many parents (4). Upon admission to the NICU, the neonatologists told us the next 16 weeks were likely to be tumultuous, filled with uncertainty, anxiety, and fear. Grace's condition could change drastically day by day, hour by hour, and even minute by minute.

The first day we saw Grace had been so exciting. We were proud parents. We knew about the possibility of lung disease of prematurity, IVH, necrotizing enterocolitis, and the typical problems faced by patients and families in the NICU (5). We asked that no treatment be withheld because of Grace's prematurity. We wanted to err on the side of life, precisely what many experts would advise when parents and physicians are faced with an uncertain prognosis (6). We knew the odds were against her, but we hoped and prayed that she would be the miracle baby doctors and nurses would talk about for years to come.

In the NICU, we quickly learned that exhaustion is a daily fact of life. My wife was in pain, compounded by the emotional turmoil of not being able to hold our daughter. We knew that Grace was supposed to be in our room, tended by her parents when she was hungry or just needed to be held. We would have done anything to take the burden of her suffering upon ourselves. My wife was traveling as frequently as possible to see our daughter. I spent nights just sitting next to Grace, feeling so proud to be her dad, and wishing with all my heart that everything would turn out well. The first time I touched her, she wrapped her tiny hand around my finger. She seemed so peaceful.

Seeing her isolated in her incubator, so innocent and fragile, was disturbing, especially when her medical team had to poke and prod her, or worse yet, place and reposition supporting lines and tubes. We worried that the stress might provoke IVH. We pestered the nurses repeatedly about whether she really needed to be handled so much. Some nurses and therapists were more gentle than others, and I felt the need to be there all the time to protect her.