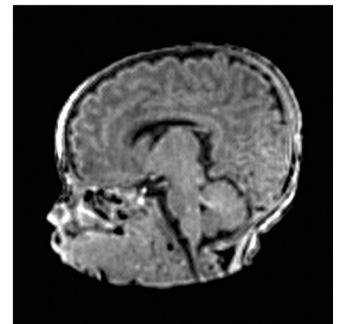
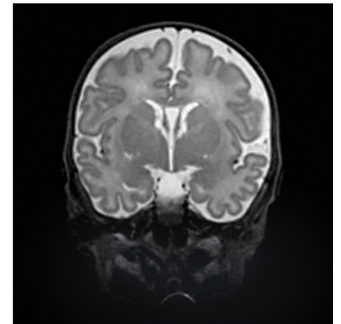
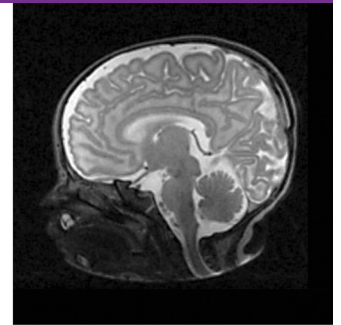


Rethinking MRI Demands in a Post COVID-19 Environment



Interviewees:

Kelsey Gentile, *Chief Technologist, MRI Educator*

Byron Gabbard, *Associate Vice President at UK HealthCare*

Alex Koroll, *System Director – Imaging Services at Main Line Health*

Embrace[®] Neonatal MRI System

Transforming Neonatal Neuro Imaging *Inside* the NICU



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A NICU-based scanner can help facilitate greater adult patient throughput and address the backlog of exams.

In March 2020, many radiology departments in hospitals and outpatient centers abruptly ceased all non-urgent and elective imaging procedures due to COVID-19, the novel coronavirus that overwhelmed healthcare systems around the world. In response to the pandemic, The American College of Radiology (ACR) endorsed guidance from the Center for Disease Control and Prevention (CDC) to reschedule non-urgent outpatient visits for imaging and fluoroscopy procedures, including screening exams¹ to slow the transmission of disease.

“We saw a significant decline, up to 70 percent particularly in service lines such as MRI and outpatient elective imaging,” says Alex Koroll, System Director – Imaging Services at Main Line Health (Philadelphia, PA). “Our MRI suites were largely idle.”

At UK Healthcare (Lexington, KY), Byron Gabbard, Associate Vice President Finance, estimates all radiology procedure volumes dropped by two-thirds. The impact on finances has been significant and not just as a result of the decrease in radiology volumes. UK Healthcare, as with many hospitals across the country, allocated enormous resources to ramp up critical services, testing capabilities and PPE to handle the influx of COVID-19 patients.

“It was all hands-on deck to secure PPE and prepare for an unknown patient surge which included setting up a temporary 400-bed field hospital at the university’s indoor practice facility for football,” Gabbard says. “Our CEO’s mantra was planning for the worst, hoping for the best.”

Adding to the financial strain for hospitals was the lack of income from elective or non-urgent procedures and surgeries. According to Gabbard, it’s not just the lost revenue from radiology exams, there’s also a downstream impact on other healthcare services as well. For example, many orthopedic patients require an MRI prior to surgery. “The lost revenue from the MRI is significant, however the OR and other procedural areas have an even larger impact on contribution in terms of revenue for our hospital,” Gabbard adds. At the peak of the shutdown, surgery cases dropped from approximately 130 a day to between 30 and 40 per day.

In hard hit areas, many hospitals stopped booking neuroradiology patients except for urgent or emergency cases after mandatory stay-at-home policies were put into place.

“In many hospitals, radiology staff had been furloughed to other departments and only urgent or emergent imaging was being performed,” says Kelsey Gentile, RT(R) (MRI), MRI Educator and Consultant at Aspect Imaging.

In terms of MRI, Gentile estimates many hospitals had a up to a 75 percent reduction in MRI exams.

“A quiet magnet is an expensive magnet,” adds Gentile.

Many outpatient imaging centers closed completely to control the spread of COVID-19, while hospitals saw a dramatic reduction in imaging volumes that were further impacted to preserve resources that would be needed as coronavirus cases surged².

Finding a New Normal

As the country began to reopen in May 2020, hospitals started to ramp up imaging services with new guidelines in place to scan patients and reduce the risk of spreading COVID-19 between patients.

According to Gentile, one approach for hospital MRI departments is to buffer the schedule to space out exams, reducing the historical daily patient capacity in the department. Patients are being booked on the hour, even for exams that may only take 30 minutes. If a patient’s exam requires 45 minutes of magnet time, then the exam may be booked for two hours. The goal is to give the MRI exam room 30 minutes for cleaning and to let the air recirculate between patients as well as decrease the number of people in the waiting room to enable social distancing. All known COVID-19 patients should be contained to one magnet and those with signs or symptoms but without a definite diagnosis may need to be rebooked.

For neonatal neuro MRI imaging, the planning workflow is complex and includes many hours of prep, scheduling, transport, and staffing coverage coordination, independent of the minimum 80-minute time slot needed on the radiology schedule. This delicate process requires a team of NICU staff, including nurses, a respiratory therapist, and a physician to accompany the critically ill infant to the imaging department. Ultimately, moving the baby outside the safety of the NICU forces staff members

to breach safety measures meticulously put into place to prevent injury and minimize infection exposure risk. Adding a global pandemic to the growing list of concerns only magnifies these risks and adds a new level of stress and anxiety for the patient, staff, and parents.

Gentile says departments are trying to maximize throughput as much as possible while maintaining safety and ensuring all cleaning and social distancing guidelines are followed.

“Having an MRI system in the NICU would be beneficial, especially in this current pandemic environment,” Gentile adds. “Rather than have the patient and the entire care team from the NICU go to the MRI department, one technologist could go up to the NICU to perform the scan. transitioned from a nice-to-have approach, to a must-have approach to mitigate the risk of infection for patients at the highest risk of complications.

That’s where Aspect Imaging’s Embrace®, the only FDA 510(k) and CE approved dedicated neonatal MRI system, can make a world of difference for the health and development of critically ill infants. Uniquely designed to be placed within the NICU, the Embrace® offers the critically valuable, timely diagnostic information only available from MRI, without the acknowledged risk of taking the baby out of the NICU.

“The Embrace® Neonatal MRI allows us to do things we couldn’t do before because of the risks of moving a baby down to the MRI suite,” says

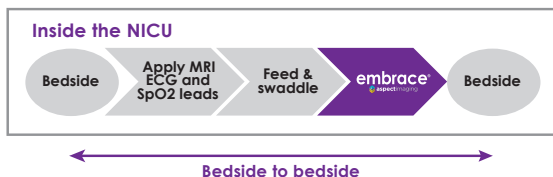
Dr. Bondurant. “It gives us timely information that will allow us to provide habilitative, early intervention services when needed. Without the Embrace® we are forced to compromise our practice and transport the baby from the safe, sterile environment of the NICU to get their MRI. We shouldn’t be breaking the practices that we so heartedly put into place to protect these babies in every way possible when there is another option.”

I would think that would be more cost effective, plus the nurses and doctor can take care of other NICU patients rather than having to leave their department with the travel time saved.”

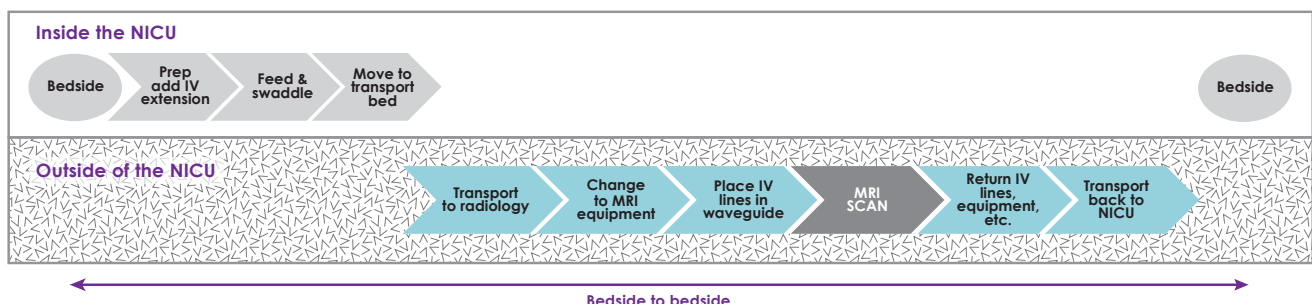
According to Gabbard, UK Healthcare had previously identified opportunities to expand outpatient MRI services due to throughput challenges and patient leakage outside the system. Due to outpatient demand, most inpatients in the hospital requiring scans had their MRI exams scheduled during the night shift, 7 pm to 7 am, which is disruptive to the patient and facility throughput. The growth and demand recently led UK Healthcare to invest in three mobile magnets at clinic locations and two permanent magnets at its community hospital in the months leading up to the pandemic.

Specific to NICU MRI utilization, UK HealthCare performs approximately 150 MRI exams on NICU patients per year, all of which require sedation to be scanned on the adult sized units, says Gabbard. “If we had a NICU-based unit, MRI would likely be utilized more on these patients due to elimination of the logistical challenges around sedation and safety concerns with immunosuppressed neonates being transported outside the unit,” he adds.

In-unit MRI keeps the workflow inside the NICU.



Off-unit MRI extends the clinical workflow and requires moving the baby out of the NICU.



A typical MRI slot pre-pandemic for adult patients was 45 minutes to one hour. However, for NICU patients, it often requires a three-hour slot due to the complicating factors associated with this delicate patient population “The capacity created on the adult scanner by moving these patients to a NICU-based unit could be used to both help improve inpatient throughput or backfilled with profitable outpatient scans that are now often resulting in delay in care or patients leaving our system for their scans.”

Patient concerns and satisfaction are an important factor in the reopening of MR imaging services, explains Mr. Koroll from Main Line Health in Pennsylvania. Some patients ask about the cleanliness of the MRI scanner and whether it was sanitized before they arrived. Although this system has noticed an uptick in scheduled exams, some of the patients remain apprehensive to have an MRI scan, especially the parents of NICU patients.



Using the Embrace®, parents can remain in the room with their baby during the entire scanning process.

“The NICU has our most vulnerable population and performing an MRI scan would be taking them out of that sanitized environment,” Koroll explains. It was not unexpected that parents would ask if the MRI was clean and safe for their baby.

While most radiology exams are approaching 90% of pre-COVID-19 volumes at Main Line Health, MRI scans are lagging behind due to the fact an MRI exam requires a referral.

“Every hospital has been impacted financially,” Koroll adds. “A key question is how to use capital moving forward?”

Koroll explains that Main Line Health was in the process of placing a 3.0T MRI in one of their facilities, pre COVID-19. Now, state guidelines are more stringent and have increased the construction costs of siting an MRI.

“It’s not just the cost of the equipment but the cost of the space,” Koroll says. “We have to rethink all these capital projects but also provide access to patients.”

Planning for the future

The pandemic will most likely have a lingering economic impact resulting in long-term or even permanent adjustments to the radiology practice². To recoup lost revenue, many hospitals are ramping up MRI and imaging services in conjunction with updating protocols to meet new demands.

However, the added expenses associated with COVID-19 (PPE, adding ICU beds, field hospitals, etc.) coupled with lost income during the shutdown are limiting these service options.

One proposed strategy for MRI departments is to replace current MRI protocols with abbreviated protocols to shorten scan times. To increase efficiencies and spread patients and staff out, hospitals and outpatient centers have moved patient volume (and staff) among facilities, staggered shifts, and expanded hours³ to meet the anticipated backlogged demand. Minimizing disruption to staffing will be important to having the ability to quickly regain baseline capacities².

With volumes still well below pre-pandemic levels, Gabbard is examining ways to help his team optimize throughput and scheduling. One positive result has been the opportunity to reschedule canceled outpatient scans at our new ambulatory sites creating open time blocks on the hospital-based scanners for inpatient throughput efficiency.

“We will recover from this,” he adds. “The question I’m asking now is, what new innovations will come from this and what does it mean going forward?”

Telehealth and telemedicine have thrived during the pandemic. Gabbard sees telehealth as a huge opportunity to help with patients who travel from rural areas to UK Healthcare as well as alleviate overcrowding in the emergency room that could impact patient safety and quality processes. He also sees potential to allow office staff to continue working at home and convert that office space to additional clinical space to help with social distancing guidelines and new revenue opportunities.

The patient access team at Main Line Health is working from home and Koroll wonders if that may be the new normal for them. While it may be some time

for healthcare systems to regain the efficiencies they had pre-pandemic, Koroll believes the pandemic will fundamentally change how hospitals work.

“Will caregivers be more reluctant to scan babies with more risk factors due to infection control,” he asks? “We carefully clean the MRI after every patient, but did we clean every surface that patient touched? Just as with 9/11, many of the interventions we are putting in place today may never leave. This is a pandemic that will change the psyche of a generation.”

The patient experience and concerns about infection prevention and safety are top of mind for many administrators and providers who care for the most vulnerable and precious patients in the NICU. In a post-pandemic healthcare environment, these concerns could be lessened by investing in an MRI system that is dedicated to the NICU. “It’s hard to not get emotionally invested when caring for these babies,” Koroll adds. “I see the staff worrying about their safety, especially when they have to take them out of the NICU and down throughout the hospital for an MRI exam. And the parents often feel powerless when their baby is moved out of the NICU to go into the MRI.”

As healthcare providers and facilities aim to safely reopen imaging services and regain pre-pandemic imaging volumes, now is the ideal time for administrators and department managers to re-evaluate how these services are delivered. In neonatal MRI, strategies such as the use of shortened protocols and expanding hours can help centers address high demand due to the backlog of imaging procedures in the short term. In the long term, a NICU-based MRI scanner can address concerns in a post-COVID-19 environment, such as infection prevention and patient safety, and provide an opportunity to maximize patient throughput by rescheduling time-consuming neonatal neuro MRI exams to a dedicated scanner located inside the NICU.

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