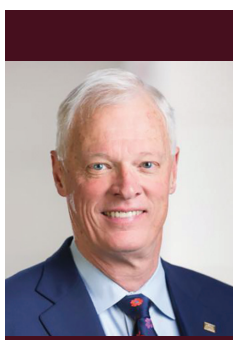


RSNA 2020: Tech Advances, Healthcare Disparities Take Center Stage

Mary Beth Massat and McKenna Bryant



RSNA President
James P. Borgstede, MD

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There is no question that the COVID-19 pandemic fundamentally changed virtually every aspect of life, education, and work around the world in the past year.

The Radiological Society of North America's Annual Scientific Meeting and Exhibition was no exception.

Far from the cavernous halls of McCormick Place in Chicago, some 29,000 radiologists, radiologic technologists, medical imaging educators, and students from 134 countries instead Zoomed into Chicago from their home offices, dining rooms, kitchens and living rooms for the 2020 virtual edition of medical imaging's king of annual meetings.

And while COVID-19 certainly made its mark on the meeting itself, the pandemic also cast a special spotlight on the pivotal role of medical imaging in all of health care, but as well as on the field's potential to help solve the many healthcare inequities that afflict much of the world's population.

Technological Advances

With respect to imaging technology progress, RSNA President James P. Borgstede, MD, who opened RSNA 2020 with his President's

Address, described radiology as a hub of biomedical innovation. He noted that the field has enjoyed a tripling of global annual patent applications during the past decade, and that technology cycle times (from product concept to launch) are half of what they were just five years ago. Dr. Borgstede explained this continued innovation are the flatteners that connect radiology worldwide, providing "the potential to equalize care for all patients, regardless of where they live."

In his address, Dr. Borgstede said, "It's our visions and insight that carry us into the future. And they keep us focused on advancing medicine and realizing the benefits of radiology in that pursuit."

Radiologic technology's importance to the care of COVID-19 patients, in particular, was the reason for presentation of the Alexander R Margulis Award for Scientific Excellence to Liming Xia, MD, PhD. Dr. Xia was awarded the honor for the February 2020 *Radiology* article, "Correlation of Chest CT and RT-PCR Testing in Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Cases," which highlighted the use of chest CT to diagnose COVID-19 cases early in the pandemic. The modality was eventually supplanted by chest radiography and ultrasound, which could be for COVID-19 patient management at the bedside to monitor the impact of the virus on a patient's lungs

Ms Massat and Ms Bryant are contributing editors to Applied Radiology.



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President-Elect of the RSNA Board of Directors

and heart, minimizing disease transmission by transporting an infected patient to a fixed radiography or CT room.

Artificial Intelligence

As it did at the 2019 annual meeting, artificial intelligence (AI) garnered its share of the limelight in the virtual exhibit hall, where radiology-related advances in AI were noted for their capabilities to improve many aspects of the field, including the diagnosis of COVID-19 with radiography and point-of-care ultrasound.

Smartphone apps, user interfaces, and virtual education and services based on AI were also highlighted for their usefulness in providing solutions to pandemic-related issues such as staff shortages and burnout among radiologists and technologists tasked with filling the gaps left by colleagues who contracted—or worse, died from—the virus.

Other key technologies included those enabling remote reading, as work-from-home arrangements have taken greater hold, and those that provide workflow solutions, such as smart scheduling tools, to help facilities and patients cope with social distancing measures.

“We are now seeing all of the various ways that AI can be employed to improve radiology practice, not only for its diagnostic potential, but also for the many ways it can expedite

workflow,” says Mary C Mahoney, MD, president-elect of the RSNA Board of Directors.

According to Dr Mahoney, the RSNA convened a number of expert panels to create consensus papers and webinars on the pandemic. These included “RSNA International Trends: A Global Perspective on the COVID-19 Pandemic and Radiology in Late 2020.”

Published in *Radiology*, the RSNA’s official journal, the paper highlights innovations that have arisen in response to the pandemic. These range from new workflows to ensure social distancing and frequent cleaning of equipment to limit transmission of the virus, to the integration of AI to identify COVID-19 in pulmonary imaging and to assist in patient-provider communications, scheduling, and remote image interpretation.¹

“Radiologists facing mounting caseloads will now be able to utilize AI to assist in some of the more time-consuming aspects of the job, enabling them to adopt a more patient-centered approach,” says Dr Mahoney, who is also the Benjamin Felson Endowed Chair and Professor of Radiology at the University of Cincinnati (UC) College of Medicine, and chief of imaging services at UC Health in Cincinnati.

Addressing Global Healthcare Inequities

For all its emphasis on the pandemic’s impact on medical imaging, RSNA 2020 also



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Kristen DeStigter, MD, FACR
Professor and Chair of Radiology,
Larner College of Medicine, University of Vermont

revealed how radiology might help address the many healthcare inequities that still exist in many parts of the world, especially in low-income countries. Dr Borgstede, a radiologist with UC Health in Denver, pointed in particular to teleradiology, handheld ultrasound, and portable radiography, as potential weapons in this battle.

“We in radiology are fortunate to have so many resources that make us a worldwide specialty. I see our resources as flatteners (to) drive globalization and create equal opportunities,” Dr Borgstede said in his welcome address. “Because all patients everywhere require and deserve basic healthcare.”

“The pandemic has shined a light on health disparities and inequities not only globally but within the United States,” agreed Mary C Mahoney, MD, president-elect of the RSNA Board of Directors. “It is vital that all patients have access to quality medical care.”

In her opening session lecture titled, “The Power of Radiology to Drive Collective Action and Transform Global Health,” Kristen DeStigter, MD, FACR, Professor and Chair of Radiology at the Larner College of Medicine at the University of Vermont, spoke of the lack of access to essential medical imaging services in many parts of the world.

According to Dr DeStigter, neither the World Health Organization nor the United Nations have addressed in any significant way through their respective healthcare guidance documents how increasing access to medical imaging can help flatten disparities in patient

care. Moreover, she said, an analysis of 79 national health plans in low income and lower-middle-income countries found that only 12 mentioned imaging or radiology.

“If imaging is invisible at the international level, imaging is invisible in the national plans and it is unfunded,” said Dr DeStigter, also the radiology health care service chief for the University of Vermont Health Network, and president and co-founder of Imaging the World, a non-profit organization providing ultrasound equipment, training and education in the world’s lowest resource settings.

Worldwide, she said, radiologic staff shortages are staggering. To wit: according to data provided by Dr DeStigter, in Malawi, there is only one radiologist to manage the imaging care of over 18 million people; and in Tunisia, just one radiologist for every 23,000 people. Procuring equipment in countries like these is as challenging as staffing. Forty-one of 135 countries, Dr DeStigter said, do not have at least one CT scanner – and most of these countries have the highest burden of non-communicable diseases.

Factors such as inadequate infrastructure (power, network connectivity) and insufficient training, service, and support further complicate access to medical imaging in these regions, she said. Lower-cost and more rugged portable imaging equipment; greater worldwide advocacy for radiology access; and partnerships between industry and governments could help alleviate some of these challenges, she added.



“Technology can reach parts of the world where radiologists or physicians cannot. And it can stay and help people all the time, which is really powerful.”

Bhavya Rehani, MD

Co-founder, CEO, and President of Health4theworld

Also with respect to worldwide healthcare inequities, Bhavya Rehani, MD, assistant professor of radiology at the University of California, San Francisco School of Medicine, brought a message of hope to her Annual Oration in Diagnostic Radiology. Sharing her experience witnessing the poor quality of care her grandparents received in rural India, Dr Rehani said that it would take the power of four “pillars” to help overcome healthcare inequities abroad and in the US: selfless service, education, technology innovation, and the global radiology community.

“Global health is not only about helping people outside the US ... but is also helping people within (the) US, especially in the rural areas. It is helping all the humanity in need,” said Dr Rehani, the co-founder, CEO, and president of Health4theworld, a non-profit organization that provides free health education and technology resources in 80 countries.

While not mentioned in her address, data show that confirmed cases and deaths of COVID-19 have occurred disproportionately among Americans of color due to discrimination, healthcare access and utilization, gaps in education and income, and housing.² Summing up her talk, Rehani called special attention to

the power of technology, particularly AI, to help provide solutions to these challenges.

“Technology can reach parts of the world where radiologists or physicians cannot. And it can stay and help people all the time, which is really powerful,” Dr Rehani said.

Indeed, quite unlike any other of its previous editions, RSNA 2020 felt the impact of COVID-19 in ways that rippled far beyond simply the need for Zoom and other technologies to help attendees keep up to date in the field, and to help retain a sense of normalcy, said Dr Mahoney.

“What this pandemic has taught us is that it is more critical than ever to come together to share ideas, learn from each other, and to foster a sense of community within our specialty during this time of crisis and physical distancing,” Dr Mahoney says.

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