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COVID-19 Pandemic: What Have We Learned and What to Expect in the Future?

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The COVID-19 pandemic resulted in an unprecedented and unexpected challenge for societies and healthcare systems, including nuclear medicine providers. This article summarizes the major events imposed on nuclear medicine by COVID-19 from a global perspective, focuses on the major lessons learned regarding attitude, medical procedures, organizational implications and strategic considerations, and then discusses what to expect (and how to prepare) for the future. While the look back to what has happened is clearly evidence based, the look ahead and the conclusions drawn require the disclaimer of only representing the personal opinion and prediction of the authors. The COVID-19 pandemic relentlessly revealed deficiencies on an organizational, systematic and leadership level in nuclear medicine and beyond. Crisis gives us the opportunity to learn and furthermore prepare for the future. The authors' take home messages include the recommendation to focus on developing a culture of responsibility and ownership as opposed to blame, strengthening teams and communication, adapting existing structures based on the lessons learned during COVID-19, as well as establishing an environment of active decision making, prioritizing proposal of solutions rather than simply stating problems, incentivizing support and collaboration, not opposition.

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Introduction

The outbreak of coronavirus or SARS-CoV -2 (COVID-19) in Wuhan, Hubei province, China, started in December 2019,¹ leading to a worldwide pandemic which was officially announced by the WHO on March 11, 2020. Detailed statistics and reports can be found at multiple resources, for example, the Robert-Koch-Institute,² the European Centre for Disease Prevention and Control (ECDC),³ the WHO—Coronavirus disease (COVID-19) Pandemic site⁴ or the John Hopkins Coronavirus Resource Centre.⁵ The coronavirus or SARS-CoV -2 pandemic has presented an extraordinary global challenge for medical care³ for over a year now. Even with an increasing number of vaccinated individuals, the challenges persist due to new virus

mutations, unequal distribution of vaccinations and people who elect to remain unvaccinated.

In this article we will begin with a short summary on how COVID-19 impacted nuclear medicine services, then focus on what was done locally to combat the challenges, followed by the major lessons learned and how we can successfully prepare for future pandemics.

COVID-19 Impact on Nuclear Medicine in a Nutshell

The very quick spread of COVID-19 tremendously strained health-care systems to their limit. Whereas initially mainly affecting emergency room and intensive care staff, it became immediately apparent that the COVID-19 pandemic would also impact Nuclear Medicine. Due to lack of evidence-based data, multiple attempts were made to collectively summarize strategies to contain the spread of the virus, while continuing to perform essential nuclear medicine procedures.⁶ On April 1, 2020, an international panel recommended to screen patients on arrival, use increased hygiene including face masks and if possible personal protection

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equipment (PPE), to cancel elective procedures, implement separate clinical teams and secure on-site radiotracer production if appropriate and feasible.⁶ In addition, social distancing and use of telephone or video conferencing was strongly recommended. Not surprisingly, the adaptation of Nuclear Medicine services worldwide also impacted the spectrum of provided diagnostic imaging procedures and therapies. A number of reports summarized the impact of COVID-19 in various countries including the United Kingdom, German speaking countries Austria, Germany, and Switzerland, as well as a global survey including 434 responses from 72 countries.⁷⁻⁹ On a global level an average decline of 54% in diagnostic procedures and 45% in nuclear medicine therapies was reported (Fig. 1). In the following months, due to a certain stabilization and adaptation to the new normal, many nuclear medicine services geared up back to normal volumes. A step-based approach advancing between partial restriction lift (end of lockdown), partial limited restrictions and the new normal was introduced and provided important support for nuclear medicine services worldwide.¹⁰ The new normal was recently summarized in a publication comparing the changes of Nuclear Medicine procedures status pre COVID-19 to the new normal in late 2020. A total of 355 questionnaires from 96 countries were analyzed reporting an overall reduction of nuclear medicine procedures by 73% in June and 57% in October 2020.¹¹ This substantial reduction was less pronounced for PET than for conventional procedures, and more pronounced in low-income countries. Despite the clear trend towards an increased demand of Nuclear Medicine procedures, the average global volumes of procedures performed were less than half compared to before the pandemic.

Major Lessons Learned

As famously stated by Albert Einstein, “In the midst of every crisis, lies great opportunity.” Fittingly, the challenges of COVID-19 brought along numerous areas of opportunity ranging from the attitude of involved nuclear medicine personnel, medical implications, but also organizational and strategic considerations. In the following paragraphs we will summarize our personal – of course subjective – learning objectives of the COVID-19 pandemic induced turbulence of the past 18 months. It should be stressed that our German and/or US-American perspective will probably be different from Asian, African, Latin American or other European

perspectives – depending on the challenges for different health care systems and socioeconomic backgrounds.

Attitude

In general, Nuclear Medicine is a specialty dominated by elective procedures, accurate planning and only limited need of ad hoc decision making. The unprecedented adaptations required by the COVID-19 pandemic required all of us to actively decide, change and modify the processes in our institutions and practices. Despite being out of medical school for years and decades, it is important to remember “not to panic, we are doctors,” as we were all trained to handle unprecedented challenges. In case of missing guidelines and standard operating procedures it helps to make oneself aware to focus on what is most relevant for the well-being of patients and personnel. And in the case of conflicting recommendations, to focus what we know best: stick to science.

In a crisis, decisions must be made and responsibility has to be assumed. Organizational units and people who are not trained in this or who are unable and/or afraid are a sitting target within the crisis. The problem is not making wrong decisions, but it's not taking decisions at all.

Medical Procedures

The use of face masks and PPEs proved to be very successful. Overall, the number of infections of the personnel while at work was very low. Obviously, it took a lot of discipline, training, and motivation to secure the comprehensive use of protective equipment but in many departments the reported number of sick days reached an all-time low. Likewise, once available, the consistent testing of all inpatients as well as symptomatic staff contributed to the overall low infection rates within nuclear medicine practices. Additionally, the implementation of phone or online consults, the reduction of in person meetings, as well as the strict adherence to social distancing even in the break room proved to limit the infection rate. Although video consults were extremely important for limiting COVID-19 exposure, they were unfortunately not reimbursed for Nuclear Medicine in Germany.

Furthermore, the recommendations of national and international societies on how to treat patients during the pandemic^{12,13} were useful, although one fourth of the survey participants did not use them.⁸

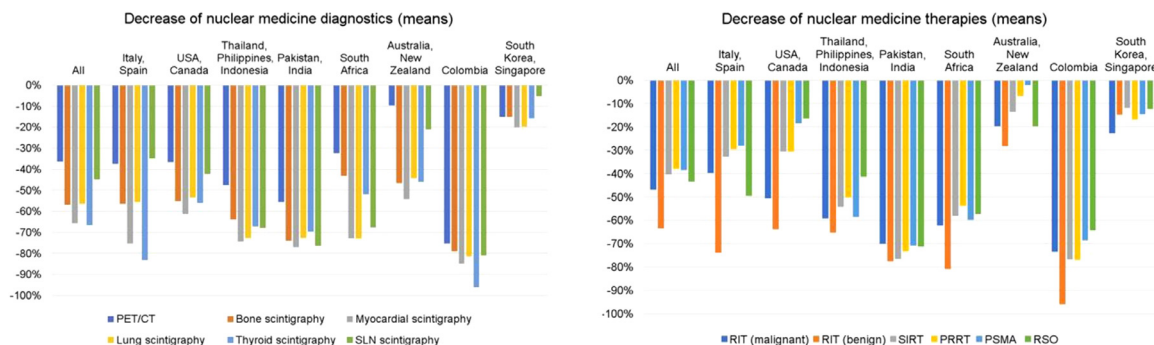


Figure 1 Adapted from Freudenberg et al., “Decrease in diagnostics procedures globally and by regional subgroups.”⁹

At the first peak of the pandemic, transfer of medical staff to other departments taking care of acute COVID-19 patients was reported by 34% of the nuclear medicine sites worldwide.⁹ Of course, this also impacted the spectrum of available nuclear medicine procedures. The more the entire health system was burdened by the pandemic, the less focus and means are dedicated to other medical needs including the care of cancer patients. In countries that were hit hard by the pandemic, such as Spain in spring and summer 2020,¹⁴ nuclear medicine departments were converted into hospital wards for the treatment of COVID-19 patients.

Organizational Implications

Crisis requires leadership as recently stated by a series of articles initiated by McKinsey.¹⁵ The authors focus on five behaviors: organizing via a network of teams, displaying deliberate calm and bounded optimism, making decisions amid uncertainty, demonstrating empathy, and communicating effectively (Fig. 2). Whereas these identified five behaviors are not specific for (nuclear) medicine they can assist in summarizing relevant implications on nuclear medicine services.

Amid the crisis, if a lack of leadership was brought to light, individuals had the opportunity to grow and advance at all levels of employment, allowing organizations to become stronger. In leadership roles, not only was it important to make decisions amid uncertainty, but to communicate them effectively and transparently. The open and inclusive discussion of developments, the reasoning behind decisions, as well as the empathic acceptance of fear and rejection proved to be essential. In addition, COVID-19 definitely ignited the digitalization of daily clinical practice with web-based online meetings, regular online-department meetings, and even online patient consults.

While many have gone above and beyond in their role and helped to fight the pandemic (eg, a COVID-19 vaccination center in a nuclear medicine practice; Fig. 3) others failed to live up to their responsibility. In particular, globally certain hospital and department management teams should critically question whether they were “on board” when the ship became distressed or whether they were hiding.

Strategic Considerations

Risk management played an important role during the pandemic. A major lesson learned is to have a strategy ready in

Organizing via a network of teams
Displaying deliberate calm and bounded optimism
Making decisions amid uncertainty
Demonstrating empathy
Communicating effectively

Figure 2 Leadership in a crisis: Responding to the coronavirus and future challenges. Created in reference to D’Auria and De Smet, “Leadership in a crisis: Responding to the coronavirus outbreak and future challenges.”¹⁵



Figure 3 A nuclear medicine practice transformed into a COVID-19 vaccination center.

case of crisis. It is clearly recommended to either initiate or strengthen an already existing structure for risk management. The joint efforts of the academic community providing recommendations for how to prepare early on were helpful,^{6,12,13} but on a local level it is important to be able to quickly implement such recommendations.

Preparing for the Future

An unforeseen disruptive event such as the COVID-19 pandemic relentlessly expose the weaknesses of (healthcare) systems. The healthcare systems worldwide were largely not well prepared for the challenges of the pandemic. This observation is somewhat surprising as, at least for Germany, an even more severe risk scenario titled “Pandemic caused by virus ‘Modi-SARS’” was published and discussed in Germany as early as 2012.¹⁶ In the corresponding hypothetical analysis, a pandemic caused by a virus with significantly higher mortality rate as reported for COVID-19 was assumed. The probability of occurrence was classified as “conditionally likely”, that is, an event that statistically usually occurs once in a period of 100-1000 years.

Looking back, the scenarios described in 2012 in regard to the healthcare system, read like a gloomy forecast for 2021: “The high number of consultations and treatments poses immense problems for both hospitals and general practitioners. Medical care is collapsing nationwide. The personnel

and material capacities are insufficient to maintain the usual care.”¹⁶ and “Emergency hospitals are set up. In the health sector, too, there are above-average staff absences (eg, due to an increased risk of infection, psycho-social stress) with a significant increase in staffing requirements at the same time. There is increasing demand for drugs, medical products, personal protective equipment, and disinfectants. Since hospitals, medical practices and authorities are usually dependent on quick subsequent deliveries, but the industry can no longer fully meet the demand, bottlenecks arise.”¹⁶

There have surely been similar considerations in other countries and regions.

Obviously, the conclusions that were drawn from this risk analysis were either insufficient or (what would be even worse) the risk was ignored. Either way, from what we have seen in the last 18 months the political and institutional risk management largely failed. To prevent something similar in the future, the following steps are recommended at individual institutions as a result of the pandemic:

- Question management structures
- Analyze and address errors
- Adapt structures
- Strengthen teams and responsibilities
- Develop a culture of responsibility and ownership
- Incentivize active decision making and enabling
- Promote constructive discussion and fight cancel culture

Whereas the majority of risk management has to happen on a higher level, such as at the governmental and healthcare system level, we also see the need to prepare and be prepared on a lower level including in nuclear medicine departments and practices. COVID-19 was just the first worldwide pandemic and we as a society, but also, we as a nuclear medicine community, should get accustomed to the fact that pandemics will accompany our globalized lifestyle.

Conclusion

COVID-19 turned out to be a true “litmus test” for our societies, healthcare systems and nuclear medicine practices. Starting from a state of crisis, our nuclear medicine practices quickly adapted, implementing a “new normal” and secured the access to important nuclear medicine procedures. However, the level of adaptation had a significant range not only depending on how severely a society was impacted by COVID-19 but also associated with the financial means available.

In addition to the impact on nuclear medicine services, the COVID-19 pandemic also relentlessly revealed deficiencies on an organizational, systematic and leadership level. Despite the severity of COVID-19 and without belittling the tremendous losses experienced worldwide, the rather mild overall impact compared to already anticipated risk scenarios gives us the opportunity to

learn and prepare for the future. We strongly recommend to focus on developing a culture of responsibility and ownership as opposed to blame, strengthening teams and communication, adapting existing structures based on the lessons learned during COVID-19, as well as establishing an environment of active decision making, prioritizing proposal of solutions rather than simply stating problems, incentivizing support and collaboration, not opposition.

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