



Working from home in pediatric radiology: *to be or not to be, it's not a simple question*

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It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change. — Charles Darwin

As a medical specialty, radiology is well suited for remote work. In fact, for more than two decades, radiologists have benefited from the Internet and picture archiving and communication systems (PACS) to interpret imaging examinations remote from the location where the examination is performed through teleradiology, often from home. The coronavirus disease 2019 (COVID-19) pandemic and resultant mitigation efforts, particularly social distancing, rapidly accelerated work-from-home arrangements across the globe, including within radiology. Two timely surveys of the membership of the Society for Pediatric Radiology (SPR) and the Society of Chiefs of Radiology at Children's Hospitals (SCORCH) by Seghers et al. [1], reported in this issue, provide important insights into various aspects of working from home that are pertinent to pediatric radiology. We thank the authors for this important contribution to our understanding of this complex and rapidly evolving new normal.

The results of these two separate surveys, sent to SPR and SCORCH members, clearly demonstrate a shift away from working physically at the hospital/clinic during the pandemic to working from home, with only 4% of responding departments not performing any rotation from home during the pandemic [1]. The majority of respondents (81–94%) had a home PACS workstation provided by their department and were satisfied with their ability to work from home, with the majority of respondents in both surveys indicating they

took 40% or fewer rotations from home [1]. These responses suggest that most departments took a hybrid-model approach with a mixture of on-site and remote radiologist rotations. The respondents, however, indicated their reduced ability to teach trainees and reduced emotional engagement as the primary drawbacks of working from home. Despite these perceived drawbacks, the majority of respondents in both surveys favored a work-from-home model post-pandemic, though the majority indicated that work from home should be limited to less than 60% of shifts [1].

Society for Pediatric Radiology respondents indicated that the lack of commute, the flexible work schedule and improved efficiency from participating in meetings remotely were the major benefits of working from home. Commuting to and from work is not only an important work-related stressor and time sink but also a significant expense and contributor to greenhouse gas emissions. A working paper from the Becker Friedman Institute estimated that 62 million commuting hours per day were saved by Americans during the pandemic as the result of the shift to working from home [2]. Commuting distance has been shown to be adversely associated with physical activity, cardiorespiratory fitness, adiposity and indicators of metabolic risks [3]. The lack of daily commute was the most significant benefit of working from home, as indicated by >90% respondents in the SPR survey [1]. Interestingly however, the Becker Friedman Institute working paper found that for employees with a graduate degree, the majority of the time saved by eliminating daily commuting (37.7%) went toward more work for the individual's primary job, much more than was spent on leisure activities, childcare, exercise or chores [2]. So while commuting time savings is viewed as a positive, some of that time saved appears to be devoted to performing more work from home.

Physician burnout, including among pediatric radiologists, is on the rise [4]. Flexibility in work schedule and increased autonomy provided by working from home could help in mitigating burnout by providing improved work–life balance [5]. Flexibility in childcare and eldercare associated

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with working from home also provides some stress relief. Frequent interruptions in the reading room during interpretation of imaging studies by clinical teams and phone calls has been shown to reduce radiologist efficiency and could lead to worse patient outcomes [6, 7]. Working from home potentially minimizes such distractions and could lead to improved efficiency. Interestingly, working from home also resulted in increased research productivity for most participants in the SPR survey [1]. Finally, the pandemic-related stress, anxiety and burnout in general have disproportionately affected female health care workers including those in pediatric radiology [4, 8]. Working from home provides much needed flexibility for many female (and male) radiologists who have often struggled during this pandemic with meeting and balancing the demands of professional and personal lives, especially with the inherent childcare needs that have resulted from virtual schooling and daycare closures.

We do not make changes for the sake of making them, but we never fail to make a change when once it is demonstrated that the new way is better than the old way. — Henry Ford

In contradistinction to the positive changes from working from home, SPR survey respondents identified decreased social and emotional engagement and poorer trainee teaching as the primary challenges when working from home [1]. SCORCH respondents identified eroded relationships between radiologists and technologists, referring providers, consulting teams and nurses as additional concerns with work-from-home arrangements [1]. While it is clear that technical innovations in videoconferencing (e.g., Zoom, Webex, Teams) have resulted in the ability to maintain a modicum of engagement between interpreting radiologists and key stakeholders both inside and outside the radiology department, the absence of direct social interactions is undoubtedly having ripple effects on our profession that must be taken into consideration.

In addition to those disadvantages identified in the SPR and SCORCH surveys, myriad other potential disadvantages must be considered when imagining the future of work-from-home arrangements, including some important impacts on personal health. A recent study among U.S. health care workers found that those working from home had a statistically significant reduction in total sleep time, including going to sleep later and waking up later, and an increase in non-work-related screen time before bed [9]. The overall health impact of these sleep-related changes is uncertain. The same study found an increase in frequency of alcohol use in the same group of at-home U.S. health care respondents [9]. Several other recent studies in individuals working from home have shown decreased physical activity compared with those who were not working from home, and these sedentary behaviors have been linked with classic

cardiometabolic risk biomarkers, as well as weight gain in those who switched to working from home [10]. Working from home has also been found to be a predictor of technostress, anxiety and depressive symptoms in recent studies, presumably related to social isolation and blurred work–life boundaries [9, 11].

Moderation in all things is the best policy. — Proverbial saying

Like most things in life, a middle-ground, hybrid approach to the future of work-from-home arrangements for pediatric radiologists is likely the optimal approach, with some rotations performed at the hospital and some remotely from home. In fact, most respondents in the SPR and SCORCH surveys indicated that a hybrid model is already being practiced by their departments and will continue to be post-pandemic [1]. Similarly, studies on telework in general have shown that the optimal number of work-from-home hours in a week to maximize job satisfaction and productivity is 8–15 h [12].

The on-site, physical presence of pediatric radiologists in the hospital/clinic is imperative to our ability to influence the medical community as whole; to maintain our relationships with our technologists, nurses and other department support staff; and to share our expertise and knowledge with our students, trainees and referring and consulting providers. Without our on-site, physical presence to some degree, we will have commoditized ourselves to the least expensive teleradiology option available to our administrative and financial decision-makers. Based on the SPR and SCORCH respondents and prior telework research, it would seem that 1–2 days per week of work from home, and the remainder from the hospital, is the optimal new-normal model.

If our future as pediatric radiologists is one in which work-from-home models become permanent, it is critical that we optimize the home work environment to minimize these negative health impacts and distractions and maximize virtual social interactions. Height-adjustable workstations, optimized workstation and home office ergonomics, and intermittent scheduled breaks for stretching, regular physical activity and eye breaks are important to minimize the potential health impacts of working from home. Developing a regular routine and clear boundaries between work and home/family and providing regular face-to-face online meetings and interactions are key to mitigating the potential negative emotional ramifications of work-from-home arrangements. Similarly, we must confront the reality that work-from-home arrangements have a negative impact (whether real or perceived) on radiology education, and thus potentially the future strength of our subspecialty. Mitigation strategies are beyond the scope of this commentary, but in summary, asynchronous learning technologies such as online modules, recorded lectures and standard review

articles, as well as synchronous learning technologies such as remote broadcasting of didactic lectures, case conferences and journal clubs and virtual readout sessions have all been successfully used during the pandemic [13]. None of these strategies, however, replaces the critical face-to-face interactions between current and potential future radiologists. Many of us pursued pediatric radiology as a career choice in no small part because of very positive personal interactions with pediatric radiology mentors.

So, while not as weighty as the life-or-death decision that Prince Hamlet bemoaned in his famous soliloquy, to be or not to be *at the hospital* remains a question for our profession to contemplate as this pandemic continues and evolves into an endemic and post-pandemic state. We think the survey results reported on by Seghers and co-authors [1], combined with other literature on the subject of remote work, point to a hybrid work model that is transparent and equitable as the ideal path forward. Finally, it is impossible to consider the future of work from home in pediatric radiology without taking into account the current severe shortage of pediatric radiologists in the labor market [14]. Radiology departments that cater to individual radiologists' desire for more work from home will have a distinct recruitment and retention advantage for the foreseeable future.

Declarations

Conflicts of interest None

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