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Realistic Productivity in Academic Neuroradiology: A National Survey of Neuroradiology Division Chiefs

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The productivity of academic neuroradiologists is typically measured by using relative value units (RVUs). RVUs are the basic component of the resource-based relative value scale, a methodology used by the Centers for Medicare & Medicaid Services (CMS) to determine the payment of physicians. RVUs define the value of a service or procedure relative to all clinical services and procedures. This measure of value is based on the time and intensity of physicians' work, expertise, as well as clinical and nonclinical resources required to deliver the health care service to patients. RVUs ultimately determine the compensation of physicians when the conversion factor, dollars per RVU, is applied to the total RVU. Private payer contracts are typically negotiated as a percentage of the CMS payment; therefore, RVUs serve as the base payment for all physicians' payment.

Organizations such as the Association of Administrators in Academic Radiology (AAARAD) and the Society of Chairs of Academic Radiology Departments maintain annual statistics about the clinical productivity of academic radiologists across North America. These statistics include the mean, median, and percentile distribution of RVUs, stratified by the radiology subspecialty and rank.[1] During the past decade, the median RVU productivity by academic neuroradiologists has grown considerably. This growth comes as the result of academic departments increasing RVU targets in step with these national norms to the 60th, 70th, and 75th percentiles of the AAARAD statistics as their goal each year so that the 60th, 70th, and 75th percentiles of 1 year become the new median of the following year.

The median RVU productivity for such statistics has reached levels that are likely not sustainable. They may jeopardize patient safety, as illustrated by a recent study showing that errors were associated with higher-volume shifts.[2] Also, these excessive targets compromise other crucial missions at academic institutions, such as education and research.

Survey

With such background in mind, we conducted a Web-based survey of the academic neuroradiology division chiefs listed by the American Society of Neuroradiology. We sent e-mail correspondence to all academic neuroradiology division chiefs in the United States, discussing the intent of the project and encouraging participation, with 3 follow-up e-mails for nonrespondents.

The responding division chiefs (Figure) reported a median of 9 faculty (interquartile range, 6–13; range, 3–60), for a total of 563 neuroradiology faculty across these 42 sites. At the time of the survey (October 2022), they were recruiting for a median of 1 open position (interquartile range, 0–2, range, 0–5), for a total of 68 open positions across these 42 sites. Of interest, there was no correlation between the number of open positions and the size of the neuroradiology division.

The 42 academic neuroradiology division chiefs reported that their faculty interprets imaging studies independently in 45% of the cases (median, 45% interquartile range, 27%–52%), with a junior trainee (first- or second-year resident) in 25% of the cases (median, 25% interquartile range, 15%–30%), and with a senior trainee (third- or fourth-year resident or fellow) in 30% of the cases (median, 30% interquartile range, 18%–50%).

On the basis of their daily expertise and experience, the 42 academic neuroradiology division chiefs were asked to estimate the number of cross-sectional studies (CT and MR imaging) a neuroradiology faculty member can reasonably and safely interpret in a regular full clinical day (excluding calls, evening coverage, and moonlighting work), considering the time taken for answering calls from technologists and consulting with clinicians. The median estimated number was 32 cross-sectional studies when reading independently (interquartile range, 23–36 studies), 25 when reading with a junior trainee (first- or second-year resident) (interquartile range, 19–30 studies), and 33 when reading with a senior trainee (third- or fourth-year resident or fellow) (interquartile range, 25–41 studies).

When asked about their division's current workload, 22% of the academic neuroradiology division chiefs thought that they were currently at capacity; 37%, that they were working above capacity; and 41%, that they were working well above capacity.

Detailed results can be found in the Online Supplemental Data.

Reflections

The median number of 32 cross-sectional studies on a standard clinical day should be considered with caution. There are many local factors that can influence the optimal number for any given academic practice. These factors include the technique-mix of cross-sectional imaging studies (a noncontrast head CT typically takes less time to interpret than a complex brain MR imaging with and without contrast, including advanced neuroimaging), the complexity of the pathology in the imaging studies (eg, an unremarkable spine MR imaging versus a complex postoperative neck cancer imaging study), as well as the number of comparison studies that need to be reviewed to provide an accurate interpretation, just to name a few. The median number of 32 is, however, helpful as a general target with appropriate adjustments to incorporate individual practice variations.

In addition, there are inherent differences among the workflows of academic neuroradiologists at different institutions, including for noninterpretive work. For example, expectations related to the protocoling of studies (preservice period of

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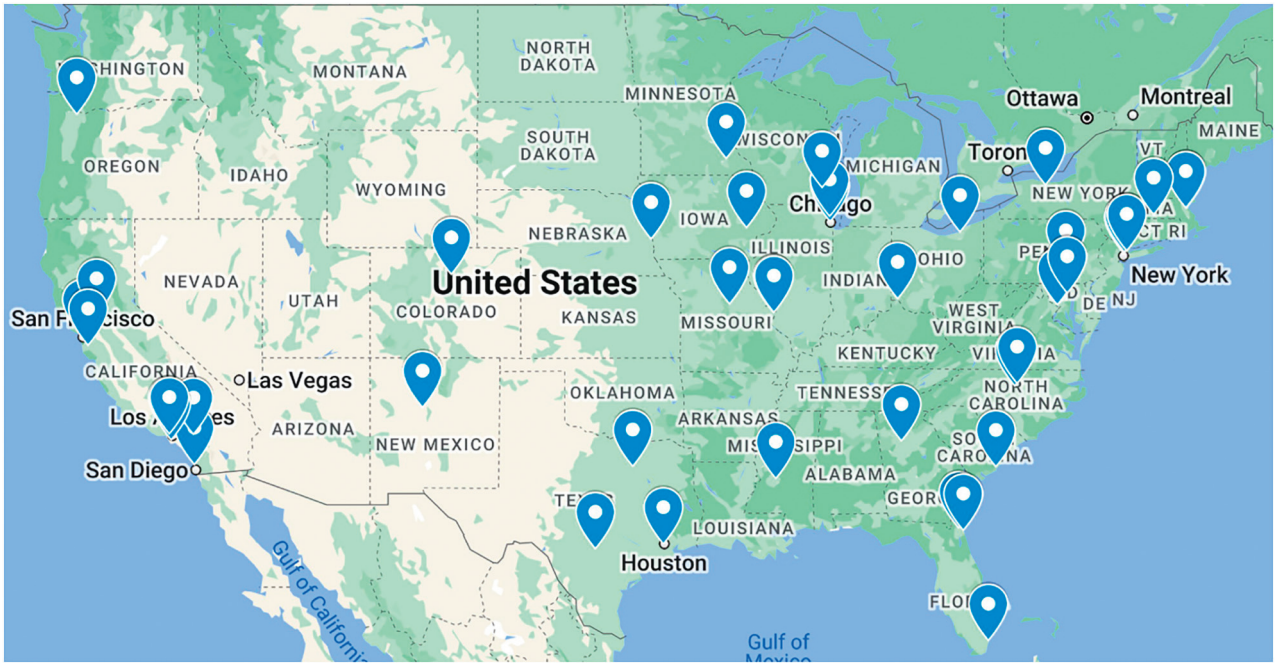

FIGURE. Geographic location of the forty-two academic neuroradiology division chiefs responded to this survey.

radiologist work) and to multidisciplinary conference and tumor board preparations and presentations (postservice period of radiologist work) are often performed on nonclinical rotations.[3,4] The addition of these noninterpretative tasks to the clinical workday may influence the radiologist's workload capacity for image interpretation.

Our survey indirectly addressed other critical missions of academic neuroradiology practices, including the time required for teaching trainees. Education is a critical mission for academic institutions but takes additional time and effort and should be factored into the overall expectations for clinical productivity.

CONCLUSIONS

Thirty-two represents a reasonable reference to guide the number of cross-sectional imaging studies (CT and MR imaging) that can be safely interpreted in a day by a typical academic neuroradiologist. This target may need to be adjusted on the basis of local practice patterns, case complexity, noninterpretive task expectations, and teaching requirements.

ACKNOWLEDGMENTS

The academic neuroradiology division chiefs of the following institutions responded to our survey:

- Baystate Medical Center/Baystate Health
- Boston Children's Hospital
- Boston Medical Center
- Cedars Sinai
- Duke University
- Emory University
- Harbor UCLA Medical Center
- Johns Hopkins University
- Loma Linda University Medical Center
- Mallinckrodt Institute of Radiology/Washington University in St. Louis
- Mayo Clinic Florida
- Mayo Clinic Rochester
- Medical College of Wisconsin
- Medical University of South Carolina
- Medstar Georgetown University Hospital
- Montefiore Medical Center/Albert Einstein College of Medicine
- Mount Sinai Hospital
- New York University Langone Medical Center
- Northwestern University
- Oregon Health & Science University
- Penn State Health Medical Center
- San Diego VA Healthcare System
- Stanford
- University Hospitals Case Western
- University of California Davis
- University of California Los Angeles
- University of California San Francisco
- University of California San Diego
- University of Cincinnati
- University of Colorado
- University of Florida Jacksonville
- University of Illinois at Chicago
- University of Iowa
- University of Maryland
- University of Miami
- University of Mississippi Medical Center
- University of Missouri
- University of Nebraska

- University of New Mexico
- University of North Carolina at Chapel Hill
- University of Rochester
- University of Texas MD Anderson Cancer Center
- University of Texas San Antonio
- University of Texas Southwestern Medical Center
- University of Utah
- University of Virginia
- Valleywise Health

Disclosure forms provided by the authors are available with the full text and PDF of this article at www.ajnr.org.

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