



Radiology Loading and Coverage Hours in Mongolia

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Establishment of the Mongolian Society of Radiology

The development of radiology has been strongly influenced by the Mongolian Society of Radiology, which was founded in 1995. In the 29 years since its establishment, the Society has made significant contributions to the fields of training, strengthening human resources in radiology, developing job requirements and workload rules, and introducing recent technology to Mongolia [1].

According to 2023 health indicator data, there are eighteen government hospitals and eighty private clinics providing in- and outpatient medical services in Ulaanbaatar, the capital city of Mongolia [2]. We have twenty-one provinces; each province has a general hospital with both in- and outpatient clinics. The government has emphasized rural areas recently, six provinces currently have designated angiographic suites, and each province has CT machines.

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Workload and Diagnostic Errors of Radiologists, Internationally

The rise in evening and overnight diagnostic radiology demands, alongside the growing need for immediate radiology interpretations, has increased the prevalence of atypical radiology schedules [3-5]. Moreover, a significant portion of the off-hour's workload consists of emergency cases, necessitating quicker turnaround times for radiology reports to reduce patient stays and enhance the overall flow within emergency departments [6]. According to a study, when attending-level coverage is unavailable at academic medical centers, residents provide interpretation after hours; their discrepancy rates closely approach the inter-observer error rates among attending radiologists [7]. However, in another study, following an overnight shift, radiologists were more fatigued with worse diagnostic performance, a 45% increase in view time per case, a 60% increase in total gaze fixations, and a 34% increase in time to fixate on fractures [8]. The effects of fatigue were more pronounced in residents than in faculty members [8]. In another study, diagnostic errors occurred throughout the day, without any increase toward the end of the day [9]. Diagnostic errors in radiology are common. The retrospective error rate among radiologic examinations can be approximately 30%, with real-time errors in daily radiology practice averaging 3%–5% [10]. The scientific evidence needed to make meaningful rules that address this is lacking, and regulating workloads without such evidence can be more harmful than not regulating at all [11]. Diagnosis and treatment delays increase healthcare costs, decrease patient satisfaction, and potentially compromise quality of care. Addressing this requires a multifaceted approach involving investment in medical education, retention strategies for healthcare professionals,

and infrastructure enhancement [12].

Working Conditions of Radiologists in Mongolia

The number of radiologists in Mongolia is sufficient compared to other medical doctors. According to medical personnel data from 2023, there were 830 radiologists in Mongolia, however, just over half of these are actively working. Radiologists discontinuing or not starting work is influenced by several factors, such as a displeasing work atmosphere or department culture, a lack of consultant or senior radiologist support, workload and night shift-related stress, awareness of diagnostic errors, and lack of opportunities for career development. Junior radiologists and residents are often scheduled to conduct ultrasounds and radiographic image interpretation early in their careers due to the high number of referrals and time-consuming imaging modalities. However, due to the low sensitivity and specificity of these exams, early-career radiologists may become aware of diagnostic errors. Overnight staffing, meanwhile, is challenging due to its less desirable working hours.

Most radiology departments in Ulaanbaatar use staffing models optimized for daytime work, e.g., 8 a.m. to 5 p.m. Evening medical imaging coverage is largely based on shift or on-call models. Rural areas, such as provincial clinics, lack radiologists. Moreover, workloads are high in the countryside, not only for radiologists but also for other subspecialized doctors. Radiologists working in rural areas may be on-call hundreds of miles away from the hospital, which can be challenging during off-work hours, such as in holiday seasons, particularly for junior and resident radiologists. Radiologists from both urban and rural areas have difficulties interpreting rare and complicated cases, especially without second reading confirmation or backup arrangements in small hospitals and clinics. To reduce the workload and coverage hours of radiologists, we are starting to implement the following measures: 1) Establishing several image reading centers, 2) Making contracts with experienced radiologists from other hospitals (private-public partnerships and partnerships between hospitals), 3) Redesigning the bonus system for radiologists and radiographers, 4) Signing contracts with foreign radiologist groups, and 5) Implementing efficient innovation, teleradiology, and artificial intelligence.

Conflicts of Interest

The authors have no potential conflicts of interest to

disclose.

Author Contributions

Conceptualization: Gonchigsuren Dagvasumberel. Data curation: Munkhbaatar Dagvasumberel. Formal analysis: Khulan Khurelsukh. Funding acquisition: Gonchigsuren Dagvasumberel. Investigation: Gonchigsuren Dagvasumberel. Methodology: Khulan Khurelsukh. Project administration: Gonchigsuren Dagvasumberel. Resources: Munkhbaatar Dagvasumberel. Software: Khulan Khurelsukh. Supervision: Gonchigsuren Dagvasumberel. Validation: Gonchigsuren Dagvasumberel. Visualization: Munkhbaatar Dagvasumberel. Writing—original draft: Khulan Khurelsukh. Writing—review & editing: Gonchigsuren Dagvasumberel.

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