

## **JCR position statement**

JCR statement on appropriate workload of radiologists

**In order to maintain the quality of radiology services, it is ideal to limit the number of radiologists' reports to less than 4 cases per hour of uninterrupted reading time (i.e. protected time excluding activities such as scheduling, conferences, and consultations). Securing a sufficient number of board-certified radiologists will be vital for providing proper radiological services.**

Note: The above mentioned number applies to the interpretation of CT, MRI, and PET-CT, but not plain films.

## **Comments**

The roles of radiologists include, but are not limited to, deciding on the appropriate imaging methods, managing the optimal protocols, giving instructions to technologists, and writing reports for the examinations performed. For instance, when choosing the appropriate examinations, radiologists have to balance multiple factors, such as invasiveness of the examinations (e.g. radiation exposure) and diagnostic ability of the modalities. They also have to carefully detect subtle but significant findings, and then make an interpretation based on the clinical data. They have to provide this information to the referring physicians (and sometimes to the patients) in a timely fashion, so that it will lead to proper treatment. In addition, it is important to monitor whether the referring physicians fully understand the contents of the reports and whether they correctly reflect them in the treatment process.

According to the draft proposal of the Japanese Health Insurance Federation for Surgery (Gaiho-ren), image interpretation of CT/MRI takes on average 14.6 min per case<sup>I</sup>. Since the services provided by radiologists include complex processes, as mentioned earlier, it will be difficult to maintain the quality of the whole process if their workload exceeds 4 cases per hour. This number will be further reduced in teaching institutions (i.e. academic or training hospitals).

Many previous studies have reported the adverse effect of shortening the interpretation time as well as of the excessive volume of interpretations<sup>II</sup>. Moreover, unread radiology reports have become a serious social problem, leading to increased demand for swift reporting<sup>III</sup>.

In 2019, CT/MRI examinations had increased by 18% from 2015. Similarly, the number of requests for Added fees for Radiological Management of Imaging-studies (ARMI) had increased by 21%. On the other hand, the number of radiologists had increased only by 10% during the same period<sup>IV</sup>.

With technological advances of CT equipment, the number of slices per case has increased dramatically<sup>V</sup>. It has been also pointed out that the number of CT and MRI studies read

annually per radiologist in Japan is 3–4 times greater than in Western developed countries<sup>VI</sup>. In addition, the required report turnaround time (RTT) has recently become shorter to meet the rules of ARMI, which makes it even more difficult to assure the quality of our image interpretation<sup>VII</sup>.

Under such circumstances, it is becoming increasingly important to check and confirm whether the messages of our report containing important or unexpected findings actually reach the referral physicians. Checking if there are any unread radiology reports might be also one of our roles. In addition, holding regular conferences/consultations between radiologists and clinicians is important in improving the quality of practice. These processes will be also important from a medical safety standpoint<sup>VIII</sup>.

We have to bear in mind that the number of CT exams in Japan per capita is 3 times greater than in the United Kingdom, and 1.8 times greater than in Germany. To assure medical quality and safety, it is an obligation of the hospital administrators to secure a sufficient number of board-certified diagnostic radiologists to handle the overwhelming volume of workload.

#### References

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<sup>I</sup> Required interpretation time can be found in the “Draft Proposal of Japanese Health Insurance Federation for Surgery”<sup>1)</sup>.

<sup>II</sup> A study reported that the average interpretation error rate at the faster speed was 26.6%, compared with 10% at normal speed<sup>2)</sup>. Another study showed that for neuroradiology cases, perception errors occurred with interpreting an average of 6 cases per hour, while no errors occurred in interpreting an average of 5 cases<sup>3)</sup>.

<sup>III</sup> Medical safety information reported by the Japan Council for Quality Health Care has repeatedly given alerts about the self-interpretation made by non-radiologist physicians. This behavior leads to inadequate confirmation of the final results provided by the radiologists<sup>4,5)</sup>.

<sup>IV</sup> This is based on the statistics for medical care activities in public health insurance by the Ministry of Health, Labour and Welfare from 2015 to 2019, before being influenced by the COVID-19 pandemic. CT examinations had increased by 22% from 2015 to 2019 (1,688,363 versus 2,057,175 exams), while MRIs increased by 12% in the same period (1,017,395 vs. 1,136,381 exams). In contrast, board-certified diagnostic radiologists have increased only by 10% from 5,251 to 5,802 in the same period.

<sup>V</sup> A survey by JCR reported that the total number of slices for CT and MRI has doubled from 2010 to 2017. The number of examinations in the same period increased by 30%<sup>6)</sup>.

<sup>VI</sup> The workload of a radiologist (CT and MRI examinations) in Japan was 4.3 times higher than the OECD average in 2004<sup>7)</sup>. This overload remained unchanged in 2015 (3 to 4 times more CT and MRI exams per radiologist)<sup>8)</sup>. Kumamaru et al. reported that Japan had only one-third the radiologists per capita compared with the USA. Although the number of radiologists per capita in Japan is similar to Germany, the workload per German radiologist is one-third compared with Japanese radiologists.

<sup>VII</sup> Acquisition of ARMI requires that 80% of radiology reports be completed and delivered to the referral physician by the next business day. In 2019, the risk of faster interpretation times has been pointed out within the “policy recommendations for the effective utilization of information of CT exams” issued by a working group in the Science Council of Japan.

<sup>VIII</sup> Dickerson et al. reported that in-person meetings with a radiologist led to changes in surgeons’ impressions in many cases, which led to changes in medical and/or surgical planning<sup>9)</sup>. This study emphasized the importance of in-person meetings between radiologists and referral physicians.