

An Algorithm for Waiting Times between Imaging Studies with Contrast Media and Prevention of Interference in Clinical Laboratory Tests

Algoritmo para Tempos de Espera entre Exames de Imagem com Meios de Contraste e Prevenção de Interferência em Testes Laboratoriais

Palavras-chave: Algoritmos; Guidelines de Prática Clínica; Meios de contraste/normas; Técnicas laboratoriais clínicas/métodos
Keywords: Algorithms; Clinical Laboratory Techniques/methods; Contrast Media/standards; Practice Guidelines

To the Editor,

Safety and appropriateness are at the core of diagnostic test prescribing, which contribute to a value-based approach and good use of healthcare resources. However, it is well established that clinicians are often unaware, unfamiliar, in disagreement, or fail to implement guidelines when making referrals, either to radiological imaging or clinical laboratory tests.^{1,2}

Contrast-enhanced imaging studies like computed tomography (CT) and magnetic resonance (MR) are critical for the diagnosis and follow-up of a wide array of diseases and are usually of two types: iodine-based and gadolinium-based media, respectively.³ Contrast media (CM) are mostly eliminated by glomerular filtration but also by hepatic excretion of up to 50% in the case of gadolinium-based media.^{4,5} In patients with normal glomerular filtration rate (90 mL/min/1.73 m²), the half-life of both contrast media in plasma is close to two hours, increasing progressively up to

30 hours in those with advanced kidney impairment (< 30 mL/min/1.73 m²).⁴ Therefore, kidney function should be determined beforehand by means of the estimated glomerular filtration rate (eGFR) for all patients undergoing contrast-enhanced imaging studies, within seven days for those with kidney impairment, and within three months for all other patients.³

Recently, the Contrast Media Safety Committee (CMSC) of the European Society of Urogenital Radiology (ESUR) issued guidelines on waiting times between imaging studies with intravascularly administered contrast media, namely, successive administration of iodine-based contrast in CT, gadolinium-based contrast in magnetic resonance (MR), or a combination of both.⁵ These recommendations are meant to avoid the accumulation of CM with potential safety issues, namely nephrotoxicity, and to avoid interference between imaging studies, as iodine-based contrast influences MR signal intensity and gadolinium-based contrast influences CT attenuation. Interference of CM with clinical laboratory tests has also been addressed by the CMSC of ESUR along with the Preanalytical Working Group of the European Society of Laboratory Medicine (PWG-EFLM) Science Committee, through the development of recommendations to perform those prior to radiological imaging with CM or to delay blood or urine collection based on clearance kinetics and the patient's kidney function.⁴

Based on both guidelines, a single algorithm (Fig. 1) was developed that can be used by prescribing clinicians and by Radiology and Laboratory professionals to schedule

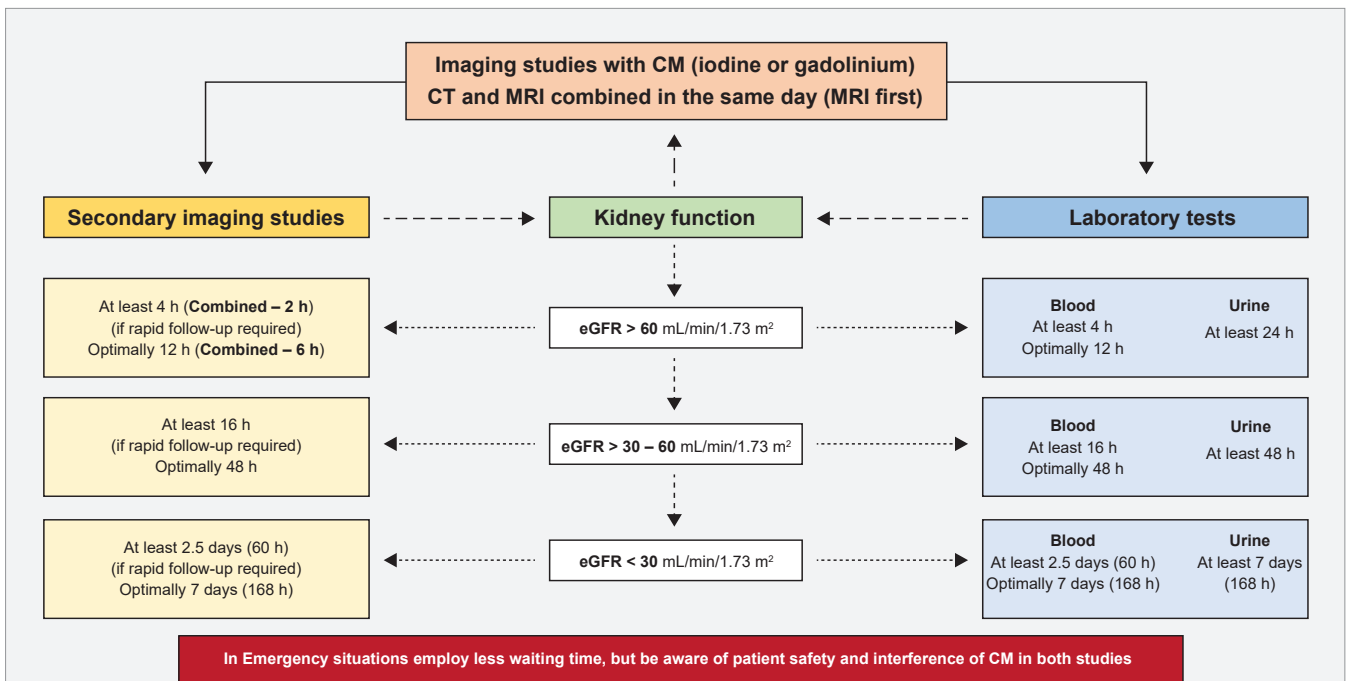


Figure 1 – Algorithm for waiting times between imaging studies with contrast media and prevention of interference in clinical laboratory tests

CM: contrast media; CT: computed tomography; MRI: magnetic resonance imaging; eGFR: estimated glomerular filtration rate

imaging studies with CM and clinical laboratory tests in a safe and timely manner. Adherence to this algorithm has the potential to ensure best practice and prevent patients from facing clinically important adverse events resulting from CM interference.

COMPETING INTERESTS

The author has declared that no competing interests exist.

FUNDING SOURCES

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

1. Bouëtté A, Karoussou-Schreiner A, Ducou Le Pointe H, Grieten M, de Kerviler E, Rausin L, et al. National audit on the appropriateness of CT and MRI examinations in Luxembourg. *Insights Imaging*. 2019;10:54.
2. Devis L, Catry E, Honore PM, Mansour A, Lippi G, Mullier F, et al. Interventions to improve appropriateness of laboratory testing in the intensive care unit: a narrative review. *Ann Intensive Care*. 2024;14:9.
3. European Society of Urogenital Radiology Contrast Media Safety Committee. *ESUR guidelines on Contrast Agents v10.0*. Vienna: ESUR; 2018.
4. van der Molen AJ, Krabbe JG, Dekkers IA, Geenen RW, Bellin MF, Bertolotto M, et al. Analytical interference of intravascular contrast agents with clinical laboratory tests: a joint guideline by the ESUR Contrast Media Safety Committee and the Preanalytical Phase Working Group of the EFLM Science Committee. *Clin Chem Lab Med*. 2023;62:608-14.
5. van der Molen AJ, Dekkers IA, Geenen RW, Bellin MF, Bertolotto M, Brismar TB, et al. Waiting times between examinations with intravascularly administered contrast media: a review of contrast media pharmacokinetics and updated ESUR Contrast Media Safety Committee guidelines. *Eur Radiol*. 2024;34:2512-23.

Francisco FREITAS✉¹

1. Microbiology Laboratory, Department Clinical Pathology, Viseu Dão-Lafões Local Health Unit. Viseu. Portugal.

✉ **Autor correspondente:** Francisco Freitas. francyske@gmail.com

Recebido/Received: 31/01/2024 - **Aceite/Accepted:** 18/03/2024 - **Publicado/Published:** 02/05/2024

Copyright © Ordem dos Médicos 2024

<https://doi.org/10.20344/amp.21296>

