

Guidelines for performing multiple sequential contrast enhanced Chest/Cardiac CTA examinations

RPC Approval:

Next Review:

Division/Faculty: Cardiothoracic Imaging – Mohammed/Blum

Subject: Guidelines for performing multiple sequential contrast enhanced Chest/Cardiac CTA examinations

Purpose: For clarification of timing for performing multiple CTA examinations of the chest in a single setting.

Policy :

CTA Studies of the chest are inclusive of any contrast enhanced CT examination for evaluation of vasculature in the chest, and are inclusive of

- CTA Pulmonary Arteries / Pulmonary Embolism
- CTA Aorta
- CTA Cardiac / Coronary Arteries
- CTV Chest

Justification for policy:

- As each examination focuses on a separate vascular structure, these examinations cannot be performed simultaneously or immediately following one another as timing for one set of vessels may introduce contrast into other vessels lowering the diagnostic accuracy of the exam.
- Performing two separate injections can result in a large contrast dose in a short span of time which has implications for potential renal impairment, especially if the patient may undergo an additional contrast enhanced procedure (such as cardiac catheterization) within hours of these examinations. Although there is no specific cumulative dose threshold above which contrast material should be delayed or withheld, in high-risk patients, if multiple sequential administrations are needed, judgment should be exercised with respect to the timing of the examinations and the clinical need for a timely diagnosis.
(<https://www.uptodate.com/contents/prevention-of-contrast-induced-acute-kidney-injury-associated-with-computed-tomography>)
- In addition, the radiation doses for coronary CTA can significantly higher (sometimes as high as 4-5x) than non-gated examinations such as CT Chest or CTA Chest Pulmonary Embolism. As such, caution is advised, especially in younger, more radio-sensitive patients, when ordering Cardiac CTA with another examination.

Timing of examinations:

- Coronary CTA should only be performed in patient who meet criteria for this exam (see <https://com-radiology.sites.medinfo.ufl.edu/wordpress/files/2019/01/Guidelines-for-ED-Patient-Cardiac-CTA-Final.pdf>)
- If both studies are indicated, the Emergency Physician should prioritize which is the more important examination, which will be performed first.
- In renal-competent or dialysis patients, to better spread out contrast dose and allow for better washout of contrast from the vessels examined, we recommend a minimum of four hours between contrast injections. Dialysis patients should ideally be dialyzed within 24 hours.
- In renal-impaired patients, this timeframe should be expanded to a minimum of twelve hours. Intravenous hydration may be beneficial between exams if patient can tolerate. Consider alternative imaging modalities, such as nuclear stress for coronary evaluation, to minimize overall contrast dose.
- In patients with acute renal failure caution is advised performing **any** contrast enhanced examination, and alternative modalities which may not cause potential damage to the kidneys, should be considered.

Exceptions

- In a critically ill patient with low suspicion for coronary artery disease and normal renal function, whom transportation to and from the CT scanner may pose a significant risk to the patient, multiple CTA studies of the chest can be performed simultaneously or sequentially.

Questions?: If there are any questions regarding timing of examinations, please direct calls to:

WEEKDAYS	
0800-1700	Cardiothoracic reading room, ask for cardiac attending
1700-0800	ED Radiology resident
WEEKENDS	
0800-0800	ED Radiology resident