



## Live Webinar: Contrast-enhanced Spectral Mammography

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7:00-8:00 pm EDT

### SAM Questions, Rationales and References

1. The primary reason contrast-enhanced MRI is effective at showing breast cancers is:

- A. lesions are visualized in 3D
- B. fat can be suppressed
- C. contrast agents enhance lesions**
- D. kinetics can be measured

**Correct answer: C**

Rationale: Breast MRI without contrast has NOT been shown to be effective at detecting cancer, even with multiple sequences. 3D alone does not allow effective cancer detection, nor does fat suppression. Kinetics are secondary to enhancement.

2. The advantages of using dual-energy subtraction, as opposed to temporal subtraction, with CEM include:

- A. full compression can be used to ensure maximum contrast uptake
- B. the patient does not need to stay still during injection
- C. multiple view of both breasts can be obtained with a single contrast injection
- D. all of the above**

**Correct answer: D**

Rationale: Because dual energy subtraction does not require a pre-contrast mask image, the contrast is injected before and imaging is performed. Therefore the patient is not in compression during injection, does not have to stay immobile and multiple views of both breasts can be obtained .

Refs:

Jong RA, Yaffe MJ, Skarpathiotakis M, et al. Contrast-enhanced digital mammography: initial clinical experience. *Radiology*. 2003 Sep;228:842-50.

Lewin JM, Isaacs PK, Vance V, Larke FJ. Dual-energy contrast-enhanced digital subtraction mammography: feasibility. *Radiology*. 2003; 229:261-268.

3. Which of the following statements are **TRUE** regarding dual-energy subtraction in CEM?

- A. Images are acquired at two x-ray energies, one before and one after contrast injection.
- B. **Iodine absorbs the high-energy beam better than the low-energy beam.**
- C. Breast tissue absorbs the high-energy beam better than does the low-energy beam.
- D. The breast is in full compression for the precontrast image and in light compression for the postcontrast image.

**Correct answer: B**

Rationale: In dual-energy CEM, both the high-energy and low-energy images are obtained after the injection. Breast tissue preferentially absorbs the low energy beam and iodine the high energy beam. The breast is not in compression during injection.

Ref: Lewin JM, Isaacs PK, Vance V, Larke FJ. Dual-energy contrast-enhanced digital subtraction mammography: feasibility. *Radiology*. 2003; 229:261-268.

4. Results of the 2013 Jochelson et al. study revealed that:

- A. CEDM had about the same sensitivity as breast MRI
- B. MRI was slightly better than CEDM for detecting additional foci
- C. CEDM had fewer false positives than MRI
- D. **all of the above**

**Correct answer: D**

Ref: Jochelson MS, Dershaw DD, Sung JS, et al. Bilateral contrast-enhanced dual-energy digital mammography: feasibility and comparison with conventional digital mammography and MR imaging in women with known breast carcinoma. *Radiology*. 2013; 266:743-751.

5. Contrast for CEDM is typically administered:

- A. At a concentration of 300 mg/ml or higher
- B. At a dose of 1.5 ml/kg body weight.
- C. Using a power injector.
- D. **All of the above.**

**Correct answer: D**

Refs: Lewin JM, Isaacs PK, Vance V, Larke FJ. Dual-energy contrast-enhanced digital subtraction mammography: feasibility. *Radiology*. 2003; 229:261-268.

Jochelson MS, Dershaw DD, Sung JS, et al. Bilateral contrast-enhanced dual-energy digital mammography: feasibility and comparison with conventional digital mammography and MR imaging in women with known breast carcinoma. *Radiology*. 2013; 266:743-751.

Chou CP, Lewin JM, Chiang CL, et al. Clinical evaluation of contrast-enhanced digital mammography and contrast-enhanced tomosynthesis--Comparison to contrast-enhanced breast MRI. *Eur J Radiol*. 2015; 84:2501-2508.