

E-Z-EM Oral Contrast* has Clinically Insignificant Artifact Rate

Introduction

Unlike conventional radiography or fluoroscopy, which are sophisticated forms of photography and television operating in the x-ray frequency band rather than the visible light spectrum, CT is an indirect technique that relies on a computer to create each "slice" from a series of images. The viscera have very similar x-ray attenuation values, meaning they are visualized as very similar shades of gray. Contrast media are used to increase the contrast of specific tissues and organs and enhance the identification of different anatomic structures, and more importantly, pathology.

CT oral contrast differentiates bowel from other anatomy. The contrast should be of uniform density with no "hot spots". If there is even a small, local area of very high density it can "confuse" the CT reconstruction algorithm and produce artifacts.

Artifacts are parts of an image that do not actually exist but are created by the imaging software. They are highly undesirable as they may mask pathology.

Perception

Radiologists know not to perform a CT examination after a high density fluoroscopic barium study until the contrast has sufficiently cleared the GI tract, because severe artifacts can be produced by residual high-density barium. This concern initially generated a common objection to the use of E-Z-EM CT oral barium contrast. There is a simple misconception that barium sulfate will produce significant artifacts.

Facts

- The barium sulfate particles in an E-Z-EM CT oral contrast are too small to cause artifacts individually.
- The robustness of the suspension formulations used minimizes flocculation, despite the hostile environment of the GI tract.
- Extensive clinical experience has demonstrated that E-Z-EM CT oral contrast has the same artifact rate as iodine-based products^{††}.
- CT barium is commonly used. In fact, over 300 million doses have been sold by E-Z-EM^{††}.

Results

Another cause of artifacts is poor filling of the bowel. If there is air in the bowel, the resultant boundary layer between the bowel gas and contrast medium (possibly in combination with residual movements) can itself cause artifacts. In these instances, the frequency of occurrence for E-Z-EM CT oral contrast is relatively low and similar to diatrizoate (see Figure 1).

Artifact	Contrast	
Marked	E-Z-CAT	2%
	Diatrizoate	4%
Weak	E-Z-CAT	50%
	Diatrizoate	46%
None	E-Z-CAT	48%
	Diatrizoate	50%

Figure 1. In a study of 100 consecutive examinations, the efficacy and tolerability of E-Z-CAT® and diatrizoate were compared. Despite E-Z-CAT being a suspension of particles and diatrizoate being a solution, the two agents had broadly comparable results for artifact production. In fact, diatrizoate produced twice the rate of artifacts classified as “marked”, such as might obscure pathology or otherwise weaken the diagnostic value of the study.¹

*E-Z-EM manufactures and markets a wide range of CT oral contrast products. All products in the range have essentially similar clinical properties, and the decision to choose one over another is based on non-medical criteria such as convenience or taste preference. Not all products manufactured by E-Z-EM are available in all global markets. Brand names used for E-Z-EM CT oral contrast products in various global territories include Smoothie, Read-Cat®, E-Z-Cat®, E-Z-Cat® Dry and BARICAT®.

†† Data on file.

References:

1. Nyman U, Dinnetz G, Anderson I. An oral contrast medium for use in computed tomography of the abdomen. *Acta Radiologica Diagnosis*; 1984;25, Fasc. 2.



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