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LETTER TO THE EDITOR

# Phantoms to simulate gastrointestinal artefact in MPI

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We thank Panagi et al. [1] for their thoughtful approach to constructing a liver phantom for myocardial perfusion imaging (MPI). There are a number of sources within the gastrointestinal system which may be responsible for artefacts in MPI (in terms of motion, scatter and attenuation). The stomach and bowel are others [2]. Would they require similar principles of design?

Stomach and bowel are also highly variable in position [3]. This would make sense particularly in viscera which are not anatomically fixed within peritoneum. Specifically, the study concentrated on cranio-caudal motion. Are other directions clinically significant in the authors' experience? How can the phantom be further enhanced to account adequately for intra-abdominal motion?

Beyond that, how could we account for artefactual gastric radiotracer uptake exacerbated by medications such as proton pump inhibitors? This is an increasingly common problem as this therapy becomes more common. We have found it to increase the frequency of image re-acquisition [4].

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## Declarations

**Conflict of interest** Joseph Lee, Jason Tse and Eoin O'Mahoney declare they have no financial and/or competing interests.

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**Consent to participate** N/A.

**Consent to publish** N/A.

## References

1. Panagi S, Hadjiconstanti A, Charitou G, Kaolis D, Petrou I, Kyriacou C, Parpottas Y (2022) A moving liver phantom in an anthropomorphic thorax for SPECT MP imaging. Phys Eng Sci Med 45:63–72. https://doi.org/10.1007/s13246-021-01081-4
2. Burrell S, MacDonald A (2006) Artifacts and pitfalls in myocardial perfusion imaging. J Nucl Med Technol 34:193–211
3. Moody RO, Van Nuys RG, Chamberlain WE (1923) Position of the stomach, liver and colon results of a roentgenologic study in six hundred healthy adults. JAMA 82:1924–1931. https://doi.org/10.1001/jama.1923.02650230008002
4. Rose DS, Robinson B, Kannan S, Lee JC (2021) Interaction between the effects of proton pump inhibitors and aspirin on gastric wall sestamibi uptake on myocardial perfusion imaging. J Nucl Cardiol 28:1976–1985. https://doi.org/10.1007/s12350-019-01951-1