



Letters

Interim ¹⁸F-FDG Positron Emission Tomography/Computed Tomography During Chemoradiotherapy in the Management of Cancer Patients: a Response



Madam — As outlined by Garibaldi *et al.* [1] in their recent letter, there is increasing interest in the use of positron emission tomography/computed tomography (PET/CT) to demarcate the biological gross tumour volume (bGTV) for radical radiotherapy treatment. In head and neck cancers, ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG)-PET/CT-defined volumes have been shown to correlate with pathological specimens better than other imaging modalities [2]. Additionally, PET/CT carried out at baseline [3] and/or during treatment [4] may offer prognostic and/or predictive information [5,6].

Adaptive radiotherapy (ART) — the alteration of a treatment plan based upon anatomical changes during radiotherapy — is a rapidly growing area. ART could improve normal tissue sparing [7] or, conversely, escalate radiotherapy doses to poorly responding tumours [8].

Garibaldi *et al.*'s [9] critical review of the utility of interim PET/CT in head and neck cancer treatment concluded that there was a need for further research into its predictive and/or prognostic role. They called for more homogenous cohorts of patients and treatment regimens, and a standardised method of analysing PET data.

The PEARL study (NCT03935672) is a multicentre phase II feasibility study designed to explore the potential of ¹⁸F-FDG-PET/CT-based ART to reduce toxicity in radically treated patients with low-risk [10] human papilloma virus-positive oropharyngeal squamous cell carcinoma. Patients will undergo interim PET/CT after 2 weeks of conventionally fractionated intensity-modulated radiotherapy.

ATLAAS (Automatic decision-Tree Learning Algorithm for Advanced Segmentation of PET images), a machine learning tool, will define the bGTV on the baseline and interim PET/CT [11]. We have shown that ATLAAS can be trained to outperform any other individual PET-based automated segmentation algorithm [12] and is a useful tool in the standardisation of PET-based segmentation within clinical radiotherapy trials.

PEARL will address many of the shortcomings identified by Garibaldi *et al.* [1]. Furthermore, PEARL will offer important insight into the feasibility of PET-based ART to improve outcomes.

Conflicts of interest

None declared.

S. Hargreaves*, E. Johnstone†, C. Parkinson†, T. Rackley*, E. Spezi†, J. Staffurth*†, M. Evans*

* Velindre Cancer Centre, Cardiff, UK

† Department of Engineering, Cardiff University, Cardiff, UK

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Carbon and Cancer

Madam — As over 1000 Extinction Rebellion protesters have recently sought arrest in London, children across the globe are marching out of classrooms to disturb our sleep-walk into catastrophic global warming and the ‘sixth mass extinction’ of our planet gains pace [1,2], it is worth reflecting on the relationship between carbon emissions and cancer.

Oncologists continue to make rapid, though marginal, improvements in the treatment of cancer [3], but unless its underlying causes are tackled, these gains will be offset by epidemiological reality. A World Health Organization report has linked climate change to malignancies of the skin, cornea, conjunctiva and uvea [4]. Ten per cent of cases of lung cancer in the UK are caused by air pollution [5] and, worldwide, there were 223 000 deaths from lung cancer attributed to air pollution in 2010 [6]. Rates of gastrointestinal, breast and bladder cancers rise with increasing emissions from motor vehicles and power stations [7,8]. Carbon emissions will therefore increase the prevalence of cancer, as well as precipitating geopolitical instability, famine and warfare; all of which have obvious public health implications [9,10].

If the oncology community accepts the scientific consensus summarised above and the premise that there still exists a window of opportunity to forestall a ‘tipping point’ [11], it could consider:

- Curtailing the use of air flight as a means of travelling to academic meetings. (Academics are outliers in their disproportionate use of air travel and thereby incur their greatest carbon debt.) [12].
- Embracing initiatives to reduce the carbon footprints of the institutions where cancer care is delivered, e.g. the NHS Carbon Reduction Strategy for England [13].
- Using its influence to advocate for meaningful political change to halt carbon emissions.

Conflicts of interest

None declared.



E. Chandy
UCL Cancer Institute, London, UK

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