of the stunning effect otherwise attributed to a pretreatment diagnostic dose of ^{131}I. We would like to comment on the following points raised in the article.

As acknowledged by the authors (*1*), it is the absorbed dose—and less so, the administered dose—that will determine the effect of the ^{131}I radiation on the tissues (*5,6*). Therefore, it is not surprising that this study found a lack of precise correlation between the administered ^{131}I diagnostic dose (ranging from 18.5 to 74 MBq) and the measured treatment/diagnostic dose ratios. (However, Table 1 (*1*) does show the lowest ratio for the highest 37-MBq diagnostic dose group, even if this was not statistically significant.)

Second, it is technically challenging to accurately measure uptake of the posttreatment dose. The authors acknowledged their inability to do so at 24 h with patients given 5.5 GBq ^{131}I treatments. We would further ask whether the linearity of such other measurements in the posttreatment time interval was validated, as this was not mentioned in the article.

Third, the authors stated the following in the Discussion under Literature Comparisons: "In only one publication was ablation observed less frequently in patients who received treatment preceded by diagnostic imaging than in patients who were treated without diagnostic imaging. . ." (*1*). In fact, there have been multiple other such reports. Lees et al. (*7*) reported that preablation diagnostic whole-body scanning performed in 36 patients with 185 MBq of ^{131}I was associated with a 47% first therapy success rate, compared with 86% in the same number of patients who had been scanned with 740 MBq of ^{123}I. A significantly greater number of total treatments and more total radioiodine were required for complete ablation among the former group versus the latter. Similarly, Chmielowiec et al. (*8*) reported a significantly lower total cumulative ^{131}I dose and fewer treatments required to achieve complete ablation after ^{131}I treatment among 105 patients who had been diagnostically scanned with a lower ^{131}I dose before treatment, versus that among 126 patients who had been first scanned with a higher ^{131}I dose (average total treatment dose = 189.7 GBq vs. 275.8 GBq, and average number of treatments = 1.51 vs. 1.83, respectively; $P < 0.01$ for both). In addition, Park et al. (*9*) reported a 72% (34/47) ^{131}I treatment efficacy among patients diagnostically scanned with 11 MBq of ^{123}I versus a 56% (24/43) treatment efficacy of ^{131}I for patients first scanned with 111–370 MBq of ^{131}I ($P = 0.125$). Although this difference did not achieve statistical significance, a clear trend of decreased treatment efficacy was nonetheless suggested when pretreatment ^{131}I diagnostic scans were used. In conjunction with the study by Muratet et al. (*10*) cited by the authors, this represents a compelling consensus of data from a total of 658 patients in direct support of the deleterious impact of ^{131}I diagnostic doses on the subsequent ^{131}I treatment efficacy for ablation.

Finally, Hilditch et al. (*4*) also described a phenomenon similar to that of Sisson et al. (*1*) in which the early treatment effects of the ^{131}I treatment dose may have contributed to the measurement of a reduced percent uptake compared with that of the prior diagnostic dose. However, the therapy/diagnostic uptake ratios were less reduced for patients who had diagnostic scans with 200 MBq of ^{123}I versus those scanned with 120 MBq of ^{131}I before ^{131}I treatment (median values, 58.5% vs. 32.8%, respectively; $P < 0.001$). Importantly, this decrement was more significant when compounded with the stunning pretreatment effect of the ^{131}I diagnostic dose. Conversely, this effect was quantitatively lessened by the use of ^{123}I instead of ^{131}I for the pretreatment diagnostic scan.

Notwithstanding potential concerns about the accuracy of measuring posttreatment ^{131}I uptake, it is conceivable that the early treatment effect could contribute to a lower measured uptake from a number of possible mechanisms. Regardless, however, we maintain that this effect would be independent of the potential deleterious effects of a prior diagnostic ^{131}I dose, a potentially significant avoidable liability that should not be discounted. We continue to advocate the use of ^{123}I when available—or, alternatively the lowest possible ^{131}I dose—for the purposes of diagnostic scanning to minimize the potential risks of compromising subsequent therapeutic efficacy caused by stunning (*11*).

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REPLY: The correspondents argue that ^{131}I in diagnostic doses has the potential to cause "stunning" of the uptake of the subsequent ^{131}I treatment dose that is given to patients with well-differentiated thyroid carcinomas. We agree that the energy deposited by ^{131}I can injure the function of residual thyroid tissues, benign and malignant. However, the questions are (i) what administered dose of diagnostic ^{131}I is unlikely to produce significant impairment of the subsequent treatment? and (ii) is there a more efficacious method of preliminary evaluation of patients who are candidates for the therapy?

Determination of the absorbed dose of radiation from a given administered dose of ^{131}I is not possible with our current methods. However, from our literature review (*1*), it seems likely that 1 mCi (37 MBq) will produce modest, if any, impairment of function in the target tissues. In any case, the largest differences between

diagnostic and therapeutic images, and in the quantitative measurements made of those images, appear to arise from early effects of the therapeutic dose (*1*).

The options for pretherapeutic assessments are no thyroid imaging, ^{123}I imaging, or ^{131}I imaging. We agree with Park (*2*) that not every patient who has had a thyroidectomy for well-differentiated thyroid carcinoma requires therapeutic radioiodine and that a decision for treatment dose will vary with the results of diagnostic scintigraphy.

Although ^{123}I imaging has many virtues, it also exhibits substantial drawbacks. The target-to-background ratio in thyroid scintigraphy is improved by waiting 2 or 3 d after the administration of either radioiodine, thereby permitting the radioiodide in nonthyroid tissues to be excreted; this has been a long-standing principle in scintigraphy of this type. The efficiency of detection of γ-photons is greater for ^{123}I but, at 2 d when ^{123}I has decayed through 3–4 half-lives, the administered dose of ^{123}I must be about 10 mCi (370 MBq) to equal the information obtained from 1 mCi of ^{131}I. Indeed, although there were no differences in accuracy between 0.3 mCi (11.1 MBq) of ^{123}I and 3–10 mCi (111–370 MBq) of ^{131}I in detecting thyroid remnants (tissues that often concentrate 1%–10% of the dose), in reassessments after ablative therapy, when any persisting tissues are less prominent, images made with ^{131}I had an advantage over ^{123}I, 92.5% vs. 69.4% (*3*).

More important is the application of dosimetry. This type of evaluation aids in determining prescriptions of therapeutic radioiodine when larger doses are thought to be more effective in treatment of health- and life-impairing carcinomas and in avoiding serious toxicity from ^{131}I as reiterated in a recent issue of *The Journal of Nuclear Medicine* (*4*). Measurements for dosimetry often require acquisitions of data for up to 4 d, information that is unattainable with any reasonable doses of ^{123}I.

In summary, even small amounts of ionizing radiation have the potential to injure thyroid tissues. However, the advantages of scintigraphy in evaluating patients with thyroid carcinoma generally override a small risk. We believe that images made with 1 mCi of ^{131}I pose a small and acceptable risk. The limitations of ^{123}I, especially in making measurements for dosimetry, are unacceptable, particularly when treating patients with advanced disease who are in the greatest need of an optimum therapeutic dose of ^{131}I.

We regret the omission of reports by Lees et al. (*5*) and Hilditch et al. (*6*) in our review of literature (*1*).

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