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# Balancing Cost and Efficiency in Screening Potential Organ Donors With Whole Body CT

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Dear Editor,

We read with interest the article “Whole body CT imaging in deceased donor screening for malignancies” by Mensink et al (Transplantation Direct 2019). The authors reported that whole body CT in deceased donors decreased periprocurement detection of malignancies by 30% (from 0.2% and 1.3% to 0% and 1% for thoracic and abdominal CT, respectively).<sup>1</sup> Although whole body CT seems justifiable to screen donors, these findings raise questions whether CT as a screening method could not be used more cost-efficiently. We calculated that whole body CT comes with an extra cost of 337,028€/5y or 67,405€/y. Although the authors conclude that 7 unnecessary procurements were prevented, this seems only true for 3/1316 (0.23%) procurements (#1, 2, 4 Table 4).<sup>1</sup> Additionally, 3 donors also underwent an unnecessary procurement procedure (#3, 4, 5, Table 5)<sup>1</sup> despite abdominal CT scan. This means that the cost per prevented unnecessary procurement amounts to 112,343€.

In our center (AZ Delta, Roeselare, Belgium, ~15–20 effective donors/y), contrast enhanced CT is increasingly/intentionally used to screen both extended criteria donors (defined as  $\geq 2$  criteria including age  $\geq 60$  y, cardiovascular/metabolic comorbidity, body mass index  $\geq 30$ , excessive smoking/alcohol use or previous malignancy) or for

anatomic reasons (eg, pancreas and small bowel donation as requested by the transplant center). Between January 1, 2019, and December 31, 2019, 13 of 25 effective donors underwent CT versus 12 of 25 standard imaging (chest X-ray and abdominal ultrasound); donor demographics are listed in Table 1. Because diagnostic CT scanning in our center is done with priority and in hemodynamically stable potential donors following appropriate and thorough donor management, there was no loss of any donors during transport nor a delay of the procurement. Our protocol foresees in high resolution thoraco-abdominal CT scan with à blanc and 3-phase with intravenous contrast, to allow for the optimal evaluation of the organ parenchymal integrity and anatomic variations.

In the CT group, 11 of 13 (84%) were extended criteria donors versus (3 of 12) 25% in the standard imaging group. In the CT group, 3 of 13 donors showed anomalies before procurement (malignancy of pancreas, bladder, and severe steatosis with bilateral hydronephrosis),

**TABLE 1.**  
Donor characteristics, stratified for imaging

	Enhanced CT group	Standard imaging group
<b>n</b>	<b>13</b>	<b>12</b>
Mean age (min-max)	60.7 (39–76)	70.4 (29–93)
Female (%)	4 (30.8%)	6 (50%)
Cause of death or reason withdrawal of life-sustaining therapy (%)		
-Post-cardiac arrest anoxemia	5 (38%)	6 (50%)
-Cerebrovascular accident	3 (23%)	4 (33%)
-Traumatic brain injury	3 (23%)	1 (7.6%)
-Other	2 (15%)	1 (7.6%)
Median donor management time (IQR) <sup>a</sup>	52 h (46–69)	31 h (24–60)
Controlled donation after circulatory death III (%)	10 (77%)	6 (50%)
Donation after brain death (%)	3 (23%)	6 (50%)
Extended criteria donor <sup>b</sup>	11/13 (84%)	3/12 (25%)
Anatomic reasons	2/13 (16%)	0/12 (0%)
Anomalies detected		
Before procurement	3/13	–
During procurement	1/13	2/12
Procurement with donation	9/13	10/12

<sup>a</sup>Donor management time, defined as the period between the moment futility of further curative care is diagnosed until the start of the procurement, was similar in the contrast enhanced and the standard imaging group.  $P=0.106$  (Mann-Whitney  $U$  test).

<sup>b</sup>Extended criteria donor defined when  $\geq 2$  criteria were present: age  $>60$  y, cardiovascular/metabolic comorbidity, body mass index  $>30$ , excessive smoking/alcohol use or previous malignancy. IQR, interquartile range.

Received 14 July 2020. Revision received 21 August 2020.

Accepted 22 August 2020.

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P.L., D.M., and P.F. acquired, analyzed, and interpreted the data, wrote the letter, and take responsibility for the integrity of the data and the accuracy of the data analysis.

The authors declare no funding or conflicts of interest.

D.M. is a senior researcher of the research foundation Flanders (Fonds Wetenschappelijk Onderzoek—Vlaanderen, FWO), Belgium.

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ISSN: 2373-8731

Transplantation Direct 2020;6: e621; doi: 10.1097/TXD.0000000000001069. Published online 23 October, 2020.

whereas in 1 donor the anomaly (severe steatosis) was detected during the procurement. In the standard imaging group, anomalies were found during 2 procurement procedures (both biopsy-confirmed lung malignancies) of which 1—in retrospect—was denied CT scan for logistical reasons. Hence, unnecessary procurement was thus avoided in 3 of 13 (23%) donors in our cohort, resulting in an extra cost to avoid 1 unnecessary procurement of 945€. Given the relatively low risk of donor-derived malignancies and to minimize any preselection for donation by ruling out other contraindications for donation,

we propose the directed and selective use of contrast enhanced whole body CT to screen extended criteria deceased donors or when detailed anatomic information is needed. Such an approach may substantially reduce the cost, avoid unnecessary procurements while safely increasing the donor organ pool.

## REFERENCES

1. Mensink JW, Pol RA, Nijboer WN, et al. Whole body CT imaging in deceased donor screening for malignancies. *Transplant Direct*. 2019;5:e509.