Journal of Medical Imaging

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Abstract. The purpose of this study was to investigate relationships between patient attributes and organ dose for a population of computational phantoms for 20 tomosynthesis and radiography protocols. Organ dose was estimated from 54 adult computational phantoms (age: 18 to 78 years, weight 52 to 117 kg) using a validated Monte-Carlo simulation (PENELOPE) of a system capable of performing tomosynthesis and radiography. The geometry and field of view for each exam were modeled to match clinical protocols. For each protocol, the energy deposited in each organ was estimated by the simulations, converted to dose units, and then normalized by exposure in air. Dose to radiosensitive organs was studied as a function of average patient thickness in the region of interest and as a function of body mass index. For tomosynthesis, organ doses were also studied as a function of x-ray tube position. This work developed comprehensive information for organ dose dependencies across a range of tomosynthesis and radiography protocols. The results showed a protocol-dependent exponential decrease with an increasing patient size. There was a variability in organ dose across the patient population, which should be incorporated in the metrology of organ dose. The results can be used to prospectively and retrospectively estimate organ dose for tomosynthesis and radiography. © 2017 Society of Photo-Optical Instrumentation Engineers (SPIE) [DOI: [10.1117/1.JMI.4.3.031207](https://doi.org/10.1117/1.JMI.4.3.031207)]

Keywords: tomosynthesis; radiography; Monte Carlo; radiation; dose; patient-specific.

Paper 17110SSPR received Apr. 25, 2017; accepted for publication Jun. 30, 2017; published online Aug. 1, 2017.

1 Introduction

Radiography and tomosynthesis are two imaging modalities that utilize ionizing radiation. Radiography generates two-dimensional images of the region of interest for a few discrete positions of the x-ray tube and is useful for imaging patients at a low cost and with low radiation dose.¹ In tomosynthesis, multiple projections of the region of interest are acquired over a predetermined sweep of the x-ray tube, which can then be reconstructed to generate semi-three-dimensional (3-D) images.^{2,3} Tomosynthesis has been developed as an imaging modality that delivers a smaller radiation dose than computed tomography (CT) while still providing 3-D type of information, analogous, but not identical to, CT.^{2,3}

While tomosynthesis and radiography procedures are both beneficial to patients when medically justified, it is important to know the radiation risk associated with these imaging modalities.⁴ Radiation risk in the clinic is currently assessed by surrogates, such as dose area product and exposure in air.⁵ While such surrogates are useful for making comparisons between tube output for different protocols of the same imaging modality and the same patient, they do not fully reflect the radiation burden to the patient, best characterized in terms of organ dose. Alternatively, effective dose has been used to characterize patient burden. However, effective dose has two key limitations: (a) It is a metric based upon a specific reference phantom and cannot be applied to individual patients;^{6,7} (b) it describes the overall radiation burden using a single number^{7,8} that does

not convey the individual dose dependencies for specific radiosensitive organs.

Currently in the clinic, patient specific radiation doses are unavailable. To assess radiation risk to specific patients, Monte-Carlo (MC) simulations can be utilized to estimate organ dose in a wide range of body sizes. Sabol et al.⁹ and Båth et al.¹⁰ used Monte-Carlo methods to estimate dose in chest tomosynthesis and radiography for a single generic phantom. It can be argued that a single patient model cannot represent a population. In fact, others have demonstrated the effect by using Monte-Carlo simulations to estimate organ dose across a population of phantoms for CT protocols.^{11–13} Sahbaee et al.¹² created a patient specific organ dose estimator for 13 CT protocols across a range of 58 anatomically variable adult computational phantoms. From the study, relationships between organ dose and patient size were derived and incorporated into an iPhone application called XCATdose that estimates patient organ dose from CT scans based upon the patient size and scanning parameters.¹² Zhang et al.¹³ studied patient-specific radiation dose for chest CT, tomosynthesis, and radiography protocols across the same phantom population, similarly showing organ dose dependencies and variabilities as a function of patient size. These studies illustrate the feasibility of estimating organ dose for a population of patients in tomosynthesis and radiography; however, they do not cover a wide range of protocol estimation.

The purpose of this study, which is built upon prior efforts, was to provide organ dose estimation for an expanded set of

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Table 1 Radiography techniques including protocol name, detector type, SID, patient thickness in the scan region, and kVp.

Protocol	Detector	SID (cm)	Thickness (cm)	kVp
Abdomen AP	Wallstand	100	18	80
			23	85
			28	90
			33	95
			38	100
Abdomen AP	Table	100	18	80
			23	85
			28	90
			33	95
			38	100
Cervical spine AP	Wallstand	100	10	75
			13	75
			15	80
Cervical spine LAT	Wallstand	180	11	75
			14	75
			17	80
Cervical spine LAT	Table	100	11	75
			14	75
			17	80
Chest PA	Wallstand	180	23	110
			28	120
			33	120
			38	120
Chest AP	Table	100	23	110
			28	120
			33	120
			38	120
Chest LAT	Wallstand	180	28	120
			33	120
			38	120
			43	120
Hip AP	Wallstand	100	17	80
			20	85
			23	85

Table 1 (Continued).

Protocol	Detector	SID (cm)	Thickness (cm)	kVp
Hip AP	Table	100	17	80
			20	80
			23	85
Knee PA	Wallstand	100	10	60
			12	60
			15	65
Knee AP	Table	100	10	60
			12	60
			15	65
Lumbar spine AP	Wallstand	100	17	80
			20	85
			23	85
Lumbar spine LAT	Wallstand	100	28	90
			23	85
			28	90
Skull PA	Wallstand	100	33	95
			38	100
			18	80
Skull LAT	Wallstand	100	19	80
			21	85
			14	75
Thoracic spine AP	Wallstand	100	16	80
			18	80
			23	85
			28	90
Thoracic spine LAT	Wallstand	100	33	95
			38	100
			23	85
			28	90
Thoracic spine AP	Table	100	33	95
			38	100
			18	80
			23	85
Thoracic spine LAT	Table	100	28	90
			33	95
			23	85
			28	90
Thoracic spine LAT	Table	100	33	95
			38	100
			23	85
			28	90

radiography and tomosynthesis protocols. In this study, a Monte-Carlo software was used to simulate dose to voxelized human models from a clinical x-ray system. The purpose of this work was to investigate relationships between patient attributes and organ doses and, in doing so, provide coefficients that can be used to prospectively or retrospectively estimate organ dose in tomosynthesis and radiography.

2 Methods

2.1 Human Models

A population of adult computational XCAT human models¹⁴ was used in the study to serve as a library of virtual patients for the MC simulations. The models provide realistic models of 54 anatomically variable patients (22 females, 32 males, ages from 18 to 78 years, and weights from 52 to 117 kg) to represent a clinical population. The phantoms are defined using nonuniform rational B-spline surfaces, which allow the flexibility to manipulate their positioning. The arms were repositioned to have a posture with either the arms up or down depending on the given exam protocol. For this study, the XCAT models were voxelized with a 3.45-mm isotropic resolution.

2.2 Protocols

The clinical x-ray modeled in this study was a typical projection x-ray system, the GE Definium 8000, GE Healthcare, Chalfont St Giles, UK. This system is a radiographic unit that can also perform tomosynthesis exams with appropriate software. Simulations for a range of typical for radiography and tomosynthesis protocols included head, cervical spine, thoracic spine, chest, lumbar spine, abdomen, hip, and knee. Radiography protocol geometries including the source-to-image distance (SID), and peak kilo-voltage (kVp) were modeled to match the institutional technique chart used clinically for imaging patients on this system (Table 1). Tomosynthesis protocol parameters including pivot point, number of projection views, and sweep range were acquired from a list of 20 technique protocols provided by the manufacturer and the institutional technique charts (Table 2).

The kVp for each patient was chosen by calculating the average thickness of the computational phantom in the region of the body being scanned. For AP/PA and lateral exams, the thickness was calculated in the AP direction and lateral direction, respectively. The kVp was determined by matching the phantom thickness to the closest thickness value on the institutional technique chart (Table 1). The x-ray spectra for each kVp were generated

Table 2 Tomosynthesis techniques including protocol, detector type, SID, sweep range, number of projections, and distance from the pivot point to the detector.

Protocol	Detector type	SID (cm)	Sweep range (deg)	Number of projections	Pivot point position (cm)
Abdomen AP	Wallstand	100	20	25	9.9
Abdomen AP	Table	100	20	25	11.6
Cervical spine AP	Wallstand	100	40	60	9.9
Cervical spine LAT	Wallstand	180	30	60	14.9
Cervical spine LAT	Table	100	30	60	16.6
Chest PA	Wallstand	180	30	60	9.9
Chest AP	Table	100	30	60	10.6
Hip AP	Wallstand	100	40	60	9.9
Hip AP	Table	100	40	60	11.6
Knee PA	Wallstand	100	40	40	9.9
Knee AP	Table	100	40	40	11.6
Lumbar spine AP	Wallstand	100	40	60	8.9
Lumbar spine LAT	Wallstand	100	30	60	13.9
Skull PA	Wallstand	100	40	60	9.9
Skull LAT	Wallstand	100	40	60	10.6
Thoracic spine AP	Wallstand	100	40	60	8.9
Thoracic spine LAT	Wallstand	100	30	60	13.9
Thoracic spine AP	Table	100	40	60	10.6
Thoracic spine LAT	Table	100	30	60	15.6

Fig. 1 A schematic drawing of the tomosynthesis acquisition geometry for a total sweep angle of 2θ . Negative angles mean that the x-ray tube is inferior to the pivot point.

using the TASMICS method developed by Hernandez and Boone.¹⁵

2.3 Tomosynthesis Geometry

The tomosynthesis exam geometry was set up independently for each projection. The total sweep angle (2θ) was used to calculate the extreme tube position locations as the tube rotates about a pivot point (Fig. 1). The tube position increment was then calculated by dividing the distance between the extreme tube positions by the number of projection images to ensure a constant step size that mimics clinical protocols.

The field of view (FOV) for each exam was calculated to include relevant organs based on imaging protocol and position of the organs of interest. In each case, the FOV included an added 3 cm margin superiorly and inferiorly to mimic margins used in a clinical setting to ensure complete anatomy coverage (Table 3). The collimation was determined at first by calculating the field size at the detector for the center tube position. For the tomosynthesis exams, the beam was collimated as a function of angle to ensure (a) the anatomy of interest was within the FOV

and (b) the x-rays would not exceed the detector FOV. The positioning of the phantom patient anatomy for each protocol was based on standard positioning guidelines.^{16,17}

2.4 Organ Dose Simulation

Organ dose estimation was performed using 8×10^7 histories and a previously validated PENELOPE Monte-Carlo simulation package.¹⁸ The number of photon histories was chosen to ensure organ dose errors of less than 5% for organs in the FOV.¹² Subsequently, the energy deposited in each organ was calculated and normalized by the number of starting photons. Then, the organ doses were calculated and normalized by a dose in air: this was done by calculating n , the number of photons per mm^2 per mR at 100 cm from the source for a given kVp. The value of n ($\text{photons}/\text{mm}^2/\text{mR}$) was calculated for each x-ray spectra.

With d (mGy/photon) as the organ dose normalized by the number of starting photons, the organ dose normalized by exposure D (mGy/mR) was calculated as

$$D = d * n * \text{FOV}.$$

This resulted in organ doses normalized by exposure in air at 100 cm, which can be used to calculate absolute organ doses when multiplied by exposure in air for varying tube currents.

2.5 Analysis

In total, organ doses were computed for all 54 adult patients in our library of computational phantoms across 20 different tomosynthesis and radiography protocols. Organ doses were analyzed as a function of patient body mass index (BMI) and average patient thickness for each tomosynthesis and radiography exam. Tables of fitting parameters and goodness of fit measures were generated for each exam protocol. For each protocol, the average thickness calculated was the average thickness in the FOV for the exam along the relevant AP/PA or lateral direction. The AP/PA and lateral protocols were analyzed as a function of corresponding thickness. Dose to a given organ was also studied for tomosynthesis across all angles of a protocol to evaluate how projection angle affects dose to a particular organ.

Table 3 Radiography and tomosynthesis exam categories with associated organ markers used for collimation.

	Top (3 cm above)	Bottom (3 cm below)	Width marker	Arm position
Chest	Lung apex	Lung base	Patient width	Arms up
Abdomen pelvis	Liver	Inferior ischium	Patient width	Arms up
Hip	Superior iliac crest	Mid femur	Half patient width	Arms up
Cervical spine	C1	C7	Patient width	Arms down
Thoracic spine	T1	T12	18 cm at detector	Arms up
Lumbar spine	L1	L5	18 cm at detector	Arms up
Head	Vertex of skull	Skull base	Patient width	Arms down
Bilateral knee	Mid femur	mid tibia	Patient width	Arms up

3 Results

3.1 Organ Dose in Tomosynthesis

In general, organ dose was found to exponentially decrease with an increase in patient BMI and average patient thickness for tomosynthesis body protocols including cervical spine, thoracic spine, lumbar spine, abdomen, chest, and hip. Tables were created for each protocol to display fitting parameters for an exponential decrease relationship with BMI and thickness with associated R^2 and root-mean-square error (RMSE) (Table 4). The fitting parameter a indicates the magnitude of the organ doses, with small and large values indicating small and large organ dose, respectively. The fitting parameter b indicates how quickly the dose changes as the patient size increases. The R^2 and RMSE parameters indicate the quality of the exponential fit with R^2 closer to 1 and RMSE closer to 0 indicating an exponential fit that better characterizes variability in the data. While there were many organs with R^2 greater than 0.4, there were few organs with R^2 above 0.9, indicating that the exponential decrease relationship with patient size can only partially explain variations in patient dose across this population. In general, organs that were closer to the FOV for the exam were more likely to have higher R^2 and lower RMSE values. For a complete list of all fitting tables for tomosynthesis, see Tables 6 to 23 in Appendix A.

For a given organ, sometimes thickness was a better descriptor of organ dose variation and other times BMI was a better descriptor of organ dose variation. For the AP abdomen tomosynthesis exam (Table 4), a greater percentage of the BMI coefficients had an R^2 greater than 0.4 compared with thickness coefficients. However, even though the BMI coefficients had a greater proportion of high R^2 values, the magnitude of the R^2 values was not always higher for BMI coefficients. For example, bladder, large intestine, and pancreas all had higher BMI R^2 values, but marrow, bone, ovaries, uterus, and vagina all had higher thickness R^2 values. In the case of bone and marrow, the R^2 parameter was much greater for thickness than for BMI (Fig. 1). The coefficients used to estimate organ dose should be chosen based on which coefficient gives the minimum error in the estimate.

For some exam protocols, BMI is not a great descriptor of patient variation because these regions do not vary significantly as a function of changing BMI. For instance, the head and knee protocols showed few exponential decrease trends relating BMI with organ dose. These exams demonstrate the variability in organ dose across a population that is not attributable to patient size. For the AP knee tomosynthesis protocol, the mean bone dose across all 54 patient models was 0.069 mGy/mR with standard deviation of 0.0055 mGy/mR. For a lateral skull exam, the mean brain dose across the models was 0.36 mGy/mR with a standard deviation 0.017 mGy/mR.

Organ dose can also be studied as a function of tomosynthesis tube position. Organ dose from an AP chest tomosynthesis protocol plotted in Fig. 2 shows the average dose as a function of the tube position for different organs in or near the FOV. The organ dose value is averaged for a given tube position across all models in the study. This figure shows that on average, the liver and stomach dose increase as the x-ray tube moves from the cranial to caudal ends of the body. However, organs such as lung, breast, and heart that are directly in the FOV for all projections show a slight parabolic or constant dose as a function of tube position.

Organ dose can also be used to compare organ dose across two different protocols for imaging the same organ. For example, organ dose for an AP thoracic spine tomosynthesis protocol can be compared with dose from a lateral thoracic spine tomosynthesis protocol as a function of tube position (Fig. 3). The AP thoracic spine protocol resulted in higher organ doses to these specific organs than the lateral protocol (Fig. 4). In both protocols, the liver dose increased as the x-ray tube moved toward the feet; however, the percent increase was greater for the lateral protocol than the AP protocol by factors of 9.4× and 1.7×, respectively.

3.2 Radiography Organ Dose

Noticeable trends were found in organ dose as a function of BMI and patient AP thickness for cervical spine, thoracic spine, lumbar spine, abdomen, and hip protocols. Table 5 shows one example of fitting parameter results and goodness of fit measures for an AP abdomen radiography protocol. For a complete list of all fitting tables for radiography, see Tables 24 to 42 in Appendix B.

Radiography exponential decrease trends with thickness and BMI were comparable to tomosynthesis trends. The thickness and BMI coefficients each had 12 organs with R^2 values greater than 0.4, which means that, in general, the BMI coefficients and the thickness coefficients are both equally good predictors of organ dose. The radiography coefficients for this exam are different from the tomosynthesis coefficients because they are generally higher R^2 values and lower RMSE values than their corresponding tomosynthesis exam. However, the radiography coefficients and tomosynthesis coefficients are similar in that they show that the same organs near the FOV have higher R^2 values than organs further away. Like tomosynthesis, in radiograph, some cases had thickness coefficients with less fitting error, and in other cases, the BMI coefficients had less error. For example, the bone and marrow doses showed a similar trend to tomosynthesis, except the R^2 values were larger for radiography BMI than for tomosynthesis BMI (Fig. 5).

4 Discussion

This study demonstrates organ dose estimation for different body organs using both patient BMI and the average patient thickness in the exam region. For some organs, exponential decrease relationships with patient thickness better described organ dose variation. In other cases, exponential decrease relationships with patient BMI better described organ dose variation. In general, the variation in dose can only be partially described by either of these exponential decrease relationships. The coefficients generated based on this population of patients can be used to estimate dose to patients with smaller error bars than prior studies that use one generic phantom alone. However, the variability in the results also indicates a need to develop a future framework for estimating organ dose for specific patients.

Our results are generally consistent with prior reports. The results show trends with an exponential decrease in size, similar to those in Zhang et al.¹³ for chest radiography and tomosynthesis protocols. Zhang et al.¹³ found an exponential decrease of correlations with increasing patient size with R^2 values ranging from 0 to 0.62 for lung, breast, and liver dose normalized by mAs. Similar R^2 magnitudes were found in this study for exponential decrease relationships as a function of patient size for radiography and tomosynthesis protocols. Our lung dose for an AP chest radiography protocol was comparable to that from previous dose estimates in lung, bone marrow, and thyroid

Table 4 Fitting parameters, a , b and goodness of fit measures, R^2 and RMSE, for exponential relationship $D = ae^{bz}$ between patient thickness (z) and organ dose (D) (left) and exponential relationship $D = ae^{bx}$ between patient BMI (x) and organ dose (D) (right) for an AP abdomen tomosynthesis protocol with table. Values in bold indicate correlations with $R^2 > 0.4$.

Organ	Thickness				BMI			
	a	b	R^2	RMSE	a	b	R^2	RMSE
Breast	0.0028	-0.0110	0.0034	0.0015	0.0020	0.0019	0.0002	0.0015
Body	0.0348	0.0119	0.0893	0.0061	0.0355	0.0101	0.1577	0.0059
Bones	0.2553	-0.0762	0.8497	0.0041	0.1269	-0.0437	0.6653	0.0061
Heart	0.0701	-0.0668	0.1189	0.0084	0.0562	-0.0532	0.1677	0.0082
Kidney	0.1580	-0.0330	0.2450	0.0130	0.1159	-0.0187	0.2025	0.0134
Lung	0.0463	-0.0728	0.1612	0.0044	0.0370	-0.0588	0.2271	0.0042
Liver	0.9270	-0.0960	0.3422	0.0383	0.6068	-0.0728	0.4284	0.0357
Spleen	0.4937	-0.0336	0.1206	0.0637	0.4313	-0.0258	0.1758	0.0617
Gall bladder	0.3544	-0.0854	0.3790	0.0160	0.2236	-0.0614	0.4264	0.0154
Stomach	1.2126	-0.0937	0.3189	0.0566	0.7870	-0.0703	0.3885	0.0536
Brain	0.0000	0.9624	-0.1513	0.0000	0.0000	0.1505	0.0376	0.0000
Bladder	0.5905	-0.0624	0.4158	0.0299	0.3759	-0.0404	0.4309	0.0296
Large intestine	0.8007	-0.0510	0.5996	0.0304	0.5707	-0.0342	0.6577	0.0281
Pancreas	0.7233	-0.0680	0.4507	0.0329	0.4541	-0.0450	0.4728	0.0323
Adrenals	0.1227	-0.0431	0.2645	0.0099	0.0778	-0.0225	0.1846	0.0104
Thyroid	0.0002	0.0297	0.0491	0.0002	0.0001	0.0372	0.1113	0.0002
Thymus	0.0068	-0.0360	0.0584	0.0015	0.0062	-0.0294	0.0772	0.0015
Larynx	0.0001	0.0309	0.0540	0.0001	0.0001	0.0377	0.1192	0.0001
Eyes	0.0000	0.0275	0.0196	0.0000	0.0000	0.0339	-0.0143	0.0000
Small intestine	0.6392	-0.0345	0.3269	0.0433	0.5508	-0.0261	0.4645	0.0386
Esophagus	0.0704	-0.0768	0.1771	0.0058	0.0468	-0.0554	0.2094	0.0057
Marrow	0.1291	-0.0734	0.8479	0.0021	0.0636	-0.0408	0.6360	0.0033
Skin	0.0328	0.0133	0.1621	0.0047	0.0348	0.0099	0.2209	0.0046
Ovaries	1.0574	-0.0939	0.8366	0.0165	0.5003	-0.0558	0.7886	0.0188
Uterus	0.8250	-0.0927	0.8363	0.0128	0.3519	-0.0505	0.7022	0.0173
Vagina	0.1667	-0.0664	0.5555	0.0072	0.0863	-0.0344	0.4452	0.0080
Prostate	0.2971	-0.0800	0.4825	0.0096	0.1189	-0.0406	0.3028	0.0112
Testes	0.0064	-0.0100	0.0088	0.0018	0.0069	-0.0118	0.0215	0.0018

Fig. 2 Bone dose and bone marrow dose showed stronger correlation with (a) average patient thickness (bone: $R^2 = 0.85$ and $RMSE = 0.004$, marrow: $R^2 = 0.85$ and $RMSE = 0.002$) than with (b) BMI (bone: $R^2 = 0.67$ and $RMSE = 0.006$, marrow: $R^2 = 0.64$ and $RMSE = 0.003$) for an AP abdomen tomosynthesis protocol.

for a male reference phantom.¹⁹ After a unit conversion, the average male lung dose from the previous work was 0.0026 mGy/mR compared with an average male lung dose of 0.0027 mGy/mR in this study. The bone marrow dose for the prior study was 0.00083 mGy/mR compared with 0.00087 mGy/mR for this study. The thyroid dose for the prior study was 0.00032 mGy/mR compared with 0.00064 mGy/mR for this study. We attribute the difference in thyroid dose to differences in collimation decisions made between the two studies. In summary, the organ doses common to both studies had the same order of magnitude.

Our results show that for most cases either patient BMI or thickness can be used to estimate patient specific organ doses. Patient BMI is easier to calculate because it does not require measuring the average patient thickness in the region of the body being exposed. Patient height and weight used to calculate BMI are commonly reported in medical records. The patient BMI can be calculated before the onset of the exam, and this could give providers an estimate of organ dose prior to exposing the patient. However, in many cases, trends as a function of patient thickness resulted in stronger

exponential correlation with organ dose. Making an estimate of average thickness can be cumbersome and inaccurate. One possibility for avoiding multiple measurements is to use the thickness measure from the orthogonal image series if multiple views are acquired for a patient.

Organ dose was chosen as the relevant metric in this study for three reasons. First, organ dose is a patient-specific metric of dose that directly quantifies the radiation burden to the patient. The granularity of organ dose highlights how one protocol results in different absorbed doses to different organs and to different patients. Second, organ dose is the best metric to approach cancer risk to radiosensitive organs. Stochastic effects such as cancers originate within the organ, so the only way to determine a relationship between cancer risk in each organ and radiation exposure is to know what dose was delivered to the organ. Deterministic effects are also described by the organ in which they originate, which leads to the third reason, which is that cumulative deterministic effects, such as erythema and epilation, are also best described and predicted on the organ level.

One limitation of this study was that the simulations cannot be applied to specific patients as organs are not always in the exact same place from patient to patient. Different distributions and relative sizes of organs can cause variations in organ dose. The results, however, can be used to inform more accurate size specific patient organ doses with better precision than prior studies that estimate organ dose for one or two reference phantoms alone. Additionally, the simulations in this study relied on protocols from one manufacturer. If another scanner was modeled, organ doses to patients would be different. However, we believe that the normalization of the organ dose by exposure in air allows one to somewhat generalize our organ dose estimates if a similar geometry is used. Prior studies have found that normalizing organ doses from CT scans by the CT dose index ($CTDI_{vol}$) makes them generalizable to different CT scanners.^{11,12,20} In a similar manner, normalization by exposure in air makes our results more generalizable to protocols with similar geometry and less susceptible to slight differences in kVp and filtration.

The scope of this study was to estimate radiation dose from clinically relevant protocols. The protocols in this study were modeled from the institutional technique charts, which were designed to optimize image quality compared with dose at the detector for radiography. The tomosynthesis geometry

Fig. 3 Breast, heart, lung, liver, and stomach dose averaged across the patient population ($p = 54$) at each acquisition angle of the x-ray tube for an AP chest tomosynthesis protocol. Negative angles mean that the tube is inferior to the pivot point.

Table 5 Fitting parameters, a , b and goodness of fit measures, R^2 and RMSE, for exponential relationship $D = ae^{bz}$ between patient thickness (z) and organ dose (D) (left) and exponential relationship $D = ae^{bx}$ between patient BMI (x) and organ dose (D) (right) for an AP abdomen radiography protocol with table. Values in bold indicate correlations with $R^2 > 0.4$.

Organ	Thickness				BMI			
	a	b	R^2	RMSE	a	b	R^2	RMSE
Breast	0.0003	-0.0421	0.0227	0.0001	0.0001	0.0052	-0.0097	0.0001
Body	0.0022	-0.0057	0.0240	0.0002	0.0020	-0.0015	0.0033	0.0002
Bones	0.0136	-0.0849	0.8826	0.0002	0.0065	-0.0504	0.7321	0.0003
Heart	0.0051	-0.0814	0.1617	0.0005	0.0042	-0.0680	0.2170	0.0004
Kidney	0.0085	-0.0442	0.3865	0.0005	0.0057	-0.0256	0.3250	0.0005
Lung	0.0033	-0.0879	0.2093	0.0002	0.0027	-0.0738	0.2849	0.0002
Liver	0.0493	-0.1028	0.4157	0.0016	0.0303	-0.0768	0.4978	0.0015
Spleen	0.0220	-0.0361	0.1524	0.0025	0.0188	-0.0271	0.2114	0.0024
Gall bladder	0.0170	-0.0898	0.4422	0.0006	0.0104	-0.0644	0.4841	0.0006
Stomach	0.0558	-0.0941	0.3830	0.0023	0.0343	-0.0685	0.4485	0.0021
Brain	0.0000	-0.0807	-0.0090	0.0000	0.0082	-0.6601	-0.1242	0.0000
Bladder	0.0287	-0.0667	0.4972	0.0012	0.0180	-0.0438	0.5238	0.0012
Large intestine	0.0380	-0.0570	0.6431	0.0013	0.0260	-0.0382	0.6969	0.0012
Pancreas	0.0318	-0.0695	0.5014	0.0013	0.0197	-0.0458	0.5203	0.0013
Adrenals	0.0065	-0.0514	0.3785	0.0004	0.0038	-0.0276	0.2715	0.0004
Thyroid	0.0000	0.0103	0.0057	0.0000	0.0000	0.0223	0.0241	0.0000
Thymus	0.0008	-0.0735	0.0921	0.0001	0.0003	-0.0345	0.1298	0.0001
Larynx	0.0000	0.0077	0.0062	0.0000	0.0000	0.0234	0.0301	0.0000
Eyes	0.0000	0.0051	0.0052	0.0000	0.0000	0.0375	0.0175	0.0000
Small intestine	0.0307	-0.0413	0.4152	0.0018	0.0250	-0.0303	0.5469	0.0015
Esophagus	0.0047	-0.0896	0.2430	0.0003	0.0029	-0.0644	0.2756	0.0003
Marrow	0.0068	-0.0821	0.8885	0.0001	0.0032	-0.0472	0.7069	0.0001
Skin	0.0029	-0.0206	0.2814	0.0002	0.0025	-0.0127	0.2559	0.0002
Ovaries	0.0473	-0.0975	0.8508	0.0007	0.0221	-0.0586	0.8158	0.0007
Uterus	0.0369	-0.0958	0.8564	0.0005	0.0158	-0.0535	0.7374	0.0007
Vagina	0.0098	-0.0751	0.6749	0.0003	0.0049	-0.0408	0.5850	0.0003
Prostate	0.0141	-0.0781	0.5555	0.0004	0.0059	-0.0407	0.3592	0.0005
Testes	0.0005	-0.0272	0.0872	0.0001	0.0005	-0.0264	0.1252	0.0001

was provided by the manufacturer, but the kVp values were not necessarily optimized for tomosynthesis image quality. A future trial would be necessary to optimize the protocols at the patient level based on calculated organ dose values in combination with image quality outcomes.

There are at least three ways that estimated organ doses reported in this study can be used by clinicians and researchers. The first way is to use organ dose to directly compare different ionizing imaging modalities. It is not possible to directly compare dose area product, peak skin dose, exposure in air, $CTDI_{vol}$,

Fig. 4 Breast, heart, lung, liver, and stomach dose averaged across the patient population ($p = 54$) at each acquisition angle of the x-ray tube for (a) an AP thoracic tomosynthesis protocol and (b) a lateral thoracic spine protocol. Negative angles mean that the tube is inferior to the pivot point.

etc., for each different modality because these metrics are not the same. Organ dose can easily be compared across modalities because it is the same metric regardless of modality. The second use of patient-specific organ estimation is as a metric for monitoring radiation delivered to a patient across the healthcare enterprise. Monitoring of radiation dose can be used to compare with national averages and to ensure compliance with imaging best practices.²¹ Monitoring also allows for more targeted prospective planning and management of cumulative radiation dose in certain at risk groups of patients.²¹ Organ dose is the best metric for monitoring dose at a patient specific level because it is the metric that allows for easiest direct knowledge of radiation burden for a given patient that is consistent across protocols. The third use of organ dose is to describe patient risk in human subject studies that use ionizing imaging. All human subject studies require informed consent about the risks associated with the study.²² A report of organ dose is the most direct way to quantify radiation risk for a patient in a consistent way across protocols.

5 Conclusion

This study demonstrated patient specific organ dose across a wide range of tomosynthesis and radiography protocols as well as anatomies. The results of this study can be used in various research and clinical applications. The organ doses coefficients reported can be used to compare dose across multiple modalities, to monitor radiation dose at a hospital, to give informed consent in human subject studies, and can be used to calculate a whole-body risk estimate. Results from this study may be used in a software application to calculate patient-specific organ dose in radiography and tomosynthesis.

Disclosures

No conflicts of interest, financial or otherwise, are declared by the authors.

Fig. 5 Bone dose and bone marrow dose showed stronger correlation with (a) average patient thickness (bone: $R^2 = 0.88$ and $RMSE = 0.0002$, marrow: $R^2 = 0.88$ and $RMSE = 0.0001$) than with (b) BMI (bone: $R^2 = 0.73$ and $RMSE = 0.0003$, marrow: $R^2 = 0.71$ and $RMSE = 0.0001$) for an AP abdomen radiography protocol.

Appendix A: Tomosynthesis Coefficient Tables

Tables 6 to 23 contain a complete list of all fitting tables for tomosynthesis.

Table 6 Abdomen AP tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Breast	0.0029	-0.0112	0.0035	0.0015	0.0021	0.0015	0.0001	0.0015
Body	0.0357	0.0110	0.0776	0.0061	0.0361	0.0095	0.1423	0.0059
Bones	0.2598	-0.0767	0.8530	0.0041	0.1290	-0.0441	0.6714	0.0061
Heart	0.0761	-0.0687	0.1211	0.0089	0.0607	-0.0548	0.1708	0.0086
Kidney	0.1611	-0.0339	0.2563	0.0129	0.1172	-0.0192	0.2122	0.0133
Lung	0.0495	-0.0744	0.1631	0.0045	0.0395	-0.0601	0.2300	0.0044
Liver	0.9371	-0.0959	0.3485	0.0382	0.6100	-0.0725	0.4341	0.0356
Spleen	0.4993	-0.0341	0.1270	0.0628	0.4342	-0.0260	0.1836	0.0607
Gall bladder	0.3597	-0.0857	0.3858	0.0160	0.2254	-0.0614	0.4317	0.0154
Stomach	1.1997	-0.0927	0.3251	0.0559	0.7776	-0.0692	0.3949	0.0529
Brain	0.0000	0.9594	-0.1564	0.0000	0.0000	0.1658	0.0338	0.0000
Bladder	0.6046	-0.0631	0.4311	0.0295	0.3836	-0.0409	0.4478	0.0291
Large intestine	0.8091	-0.0516	0.6049	0.0303	0.5747	-0.0345	0.6629	0.0280
Pancreas	0.7299	-0.0683	0.4594	0.0326	0.4566	-0.0451	0.4805	0.0319
Adrenals	0.1271	-0.0443	0.2803	0.0098	0.0796	-0.0232	0.1957	0.0103
Thyroid	0.0002	0.0289	0.0465	0.0002	0.0001	0.0373	0.1077	0.0002
Thymus	0.0071	-0.0367	0.0604	0.0015	0.0064	-0.0300	0.0797	0.0015
Larynx	0.0001	0.0317	0.0551	0.0001	0.0001	0.0388	0.1223	0.0001
Eyes	0.0000	0.0112	0.0058	0.0000	0.0000	0.0205	-0.0103	0.0000
Small intestine	0.6495	-0.0353	0.3373	0.0431	0.5561	-0.0266	0.4748	0.0384
Esophagus	0.0739	-0.0778	0.1824	0.0060	0.0488	-0.0560	0.2145	0.0058
Marrow	0.1315	-0.0740	0.8521	0.0021	0.0646	-0.0412	0.6426	0.0033
Skin	0.0336	0.0123	0.1416	0.0047	0.0353	0.0093	0.1971	0.0046
Ovaries	1.0621	-0.0942	0.8380	0.0165	0.5024	-0.0560	0.7912	0.0187
Uterus	0.8363	-0.0933	0.8404	0.0127	0.3560	-0.0510	0.7081	0.0172
Vagina	0.1724	-0.0670	0.5706	0.0071	0.0893	-0.0350	0.4632	0.0080
Prostate	0.3023	-0.0798	0.4870	0.0098	0.1211	-0.0404	0.3052	0.0114
Testes	0.0069	-0.0119	0.0118	0.0019	0.0073	-0.0129	0.0254	0.0019

Table 7 Chest AP tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Breast	0.7033	0.0243	0.4833	0.0845	0.9687	0.0099	0.3288	0.0963
Body	0.1266	-0.0067	0.0373	0.0096	0.1138	-0.0021	0.0147	0.0097
Bones	0.4563	-0.0293	0.3795	0.0220	0.3352	-0.0148	0.3853	0.0219
Heart	1.0561	-0.0132	0.1567	0.0614	0.9428	-0.0076	0.2050	0.0596
Kidney	0.3815	-0.0690	0.2827	0.0200	0.1768	-0.0332	0.2543	0.0204
Lung	1.0355	-0.0221	0.2549	0.0606	0.8549	-0.0127	0.3283	0.0576
Liver	0.6839	-0.0221	0.1343	0.0588	0.5426	-0.0112	0.1351	0.0588
Spleen	0.0660	0.0435	0.0361	0.1268	0.1047	0.0218	0.0340	0.1270
Gall bladder	0.7900	-0.0591	0.3230	0.0427	0.4443	-0.0316	0.3551	0.0417
Stomach	0.4000	0.0040	0.0024	0.0961	0.4950	-0.0042	0.0104	0.0957
Brain	0.0025	0.0208	0.0637	0.0009	0.0024	0.0200	0.2392	0.0008
Bladder	0.0009	0.0180	0.0123	0.0007	0.0015	-0.0012	0.0002	0.0007
Large intestine	0.0150	0.0705	0.2324	0.0310	0.0347	0.0321	0.1882	0.0319
Pancreas	0.2766	-0.0116	0.0099	0.0639	0.2693	-0.0093	0.0250	0.0634
Adrenals	0.8813	-0.0699	0.4016	0.0356	0.4014	-0.0334	0.3551	0.0369

Table 7 (Continued).

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Thyroid	1.0174	−0.0326	0.0778	0.1349	0.5094	−0.0036	0.0041	0.1402
Thymus	1.2596	−0.0150	0.1409	0.0855	1.1109	−0.0087	0.1925	0.0828
Larynx	0.0666	0.0296	0.0748	0.0384	0.0641	0.0274	0.2676	0.0342
Eyes	0.0021	0.0588	0.3581	0.0019	0.0031	0.0379	0.5966	0.0015
Small intestine	0.0272	0.0390	0.0858	0.0249	0.0413	0.0193	0.0790	0.0250
Esophagus	1.2986	−0.0483	0.6958	0.0334	0.7081	−0.0208	0.5157	0.0421
Marrow	0.3101	−0.0341	0.5948	0.0099	0.2110	−0.0162	0.5383	0.0106
Skin	0.1141	−0.0055	0.0259	0.0089	0.1204	−0.0069	0.1591	0.0083
Ovaries	0.0015	0.0235	0.0263	0.0010	0.0022	0.0058	0.0100	0.0010
Uterus	0.0011	0.0265	0.0361	0.0008	0.0017	0.0076	0.0176	0.0008
Vagina	0.0003	0.0393	0.0939	0.0002	0.0005	0.0130	0.0468	0.0002
Prostate	0.0009	−0.0153	−0.0011	0.0003	0.0012	−0.0252	0.0616	0.0003
Testes	0.0008	−0.0743	−0.0099	0.0002	0.0006	−0.0551	0.0891	0.0002

Table 8 Chest PA tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Breast	0.2879	−0.0903	0.5044	0.0078	0.1131	−0.0463	0.4803	0.0080
Body	0.0433	−0.0143	0.1617	0.0026	0.0390	−0.0089	0.2495	0.0024
Bones	0.1576	−0.0240	0.4052	0.0067	0.1223	−0.0120	0.4089	0.0067
Heart	0.2411	−0.0440	0.5457	0.0086	0.1278	−0.0159	0.2898	0.0107
Kidney	0.3615	−0.0935	0.2849	0.0143	0.1772	−0.0577	0.3805	0.0133
Lung	0.3513	−0.0327	0.5697	0.0117	0.2332	−0.0141	0.4312	0.0135
Liver	0.1626	−0.0359	0.2326	0.0118	0.1106	−0.0179	0.2263	0.0119
Spleen	0.0329	−0.0195	0.0200	0.0076	0.0277	−0.0111	0.0251	0.0076
Gall bladder	0.2210	−0.0255	0.0835	0.0261	0.1737	−0.0139	0.0988	0.0259
Stomach	0.1431	−0.0354	0.1735	0.0120	0.0892	−0.0142	0.1113	0.0125
Brain	0.0007	0.0255	0.0784	0.0003	0.0006	0.0229	0.2411	0.0003
Bladder	0.0002	0.0203	−0.0052	0.0001	0.0004	−0.0135	0.0153	0.0001
Large intestine	0.0082	0.0129	0.0126	0.0035	0.0094	0.0065	0.0128	0.0035
Pancreas	0.0904	−0.0345	0.0969	0.0108	0.0699	−0.0214	0.1415	0.0105
Adrenals	0.5962	−0.0760	0.3623	0.0249	0.3362	−0.0470	0.5018	0.0220
Thyroid	0.0232	0.0232	0.0628	0.0096	0.0220	0.0223	0.2360	0.0087
Thymus	0.1556	−0.0375	0.3959	0.0075	0.0870	−0.0121	0.1694	0.0088
Larynx	0.0059	0.0470	0.1752	0.0051	0.0070	0.0355	0.4021	0.0044
Eyes	0.0006	0.0265	0.0931	0.0002	0.0006	0.0224	0.2787	0.0002
Small intestine	0.0141	−0.0120	0.0107	0.0033	0.0123	−0.0059	0.0098	0.0033
Esophagus	0.1449	−0.0178	0.2623	0.0073	0.1110	−0.0061	0.1234	0.0080
Marrow	0.1023	−0.0270	0.4518	0.0041	0.0785	−0.0143	0.5048	0.0039
Skin	0.0352	−0.0120	0.0792	0.0028	0.0324	−0.0076	0.1272	0.0027
Ovaries	0.0005	0.0000	0.0001	0.0002	0.0006	−0.0054	−0.0029	0.0002
Uterus	0.0004	0.0039	0.0084	0.0002	0.0005	−0.0038	−0.0052	0.0002
Vagina	0.0001	0.0143	0.0514	0.0000	0.0001	0.0032	0.0086	0.0000
Prostate	0.0002	−0.0118	0.0005	0.0001	0.0003	−0.0244	0.0719	0.0001
Testes	0.0620	−0.3908	−0.1319	0.0000	0.0030	−0.2241	0.1787	0.0000

Table 9 Cervical spine AP tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.7870	−0.2913	0.2346	0.0037	0.0106	−0.0272	0.0255	0.0042
Body	0.0494	−0.0514	0.5018	0.0014	0.0301	−0.0149	0.5753	0.0013
Bones	0.1673	−0.0496	0.4953	0.0049	0.0819	−0.0056	0.0887	0.0066
Heart	0.0003	0.1579	0.1027	0.0036	0.0006	0.0812	0.4427	0.0028
Kidney	0.0006	−0.0282	0.0331	0.0001	0.0002	0.0110	0.0292	0.0001
Lung	0.0142	0.0104	0.0019	0.0057	0.0078	0.0279	0.1968	0.0051
Liver	0.0001	0.1260	0.0948	0.0007	0.0002	0.0585	0.3477	0.0006
Spleen	0.0000	0.1915	0.1131	0.0003	0.0001	0.0520	0.1393	0.0003
Gall bladder	0.0010	0.0111	0.0011	0.0006	0.0004	0.0409	0.1988	0.0006
Stomach	0.0001	0.1312	0.1047	0.0005	0.0002	0.0608	0.3831	0.0004
Brain	0.0218	−0.0005	0.0001	0.0022	0.0180	0.0067	0.1211	0.0020
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.1552	0.1042	0.0001	0.0000	0.0505	0.3697	0.0001
Pancreas	0.0002	0.0702	0.0325	0.0003	0.0001	0.0545	0.2673	0.0003
Adrenals	0.0016	−0.0347	0.0121	0.0004	0.0004	0.0248	0.0880	0.0004
Thyroid	4.8267	−0.1181	0.4384	0.1163	1.8612	−0.0411	0.7353	0.0799
Thymus	0.0004	0.2227	0.1653	0.0153	0.0018	0.0893	0.4705	0.0122
Larynx	1.8591	−0.0695	0.3962	0.0669	1.1327	−0.0266	0.7863	0.0398
Eyes	0.1575	0.0171	0.0534	0.0214	0.1863	0.0048	0.0609	0.0213
Small intestine	0.0000	0.0974	0.0025	0.0001	0.0000	0.0450	0.2683	0.0001
Esophagus	0.6266	−0.1311	0.4331	0.0137	0.1637	−0.0350	0.4180	0.0138
Marrow	0.0472	−0.0396	0.4885	0.0013	0.0291	−0.0077	0.2584	0.0016
Skin	0.0437	−0.0210	0.2717	0.0015	0.0335	−0.0038	0.1252	0.0016
Ovaries	0.0001	−0.3332	−0.0390	0.0000	0.0021	−0.5738	−0.1318	0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 10 Cervical spine LAT tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0016	−0.0212	0.0027	0.0010	0.0051	−0.0595	0.0879	0.0010
Body	0.0087	−0.0141	0.1302	0.0006	0.0101	−0.0159	0.6497	0.0004
Bones	0.0259	−0.0107	0.0902	0.0019	0.0227	−0.0031	0.0297	0.0019
Heart	0.0002	0.0695	0.1952	0.0003	0.0002	0.0438	0.3454	0.0002
Kidney	0.0000	0.0413	−0.0138	0.0000	0.0000	0.0077	0.0185	0.0000
Lung	0.0010	0.0407	0.1256	0.0006	0.0011	0.0277	0.2541	0.0006
Liver	0.0000	0.1068	0.2476	0.0001	0.0001	0.0524	0.3172	0.0001
Spleen	0.0000	0.1509	0.2292	0.0001	0.0000	0.0352	0.1201	0.0001
Gall bladder	0.0000	0.0584	0.0577	0.0001	0.0000	0.0394	0.2142	0.0001
Stomach	0.0000	0.0856	0.1948	0.0001	0.0000	0.0422	0.3102	0.0001
Brain	0.0116	0.0032	0.0064	0.0013	0.0096	0.0092	0.2124	0.0011
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.2036	0.1806	0.0000	0.0000	0.0843	0.2674	0.0000
Pancreas	0.0000	0.0948	0.1628	0.0000	0.0000	0.0348	0.2190	0.0000
Adrenals	0.0001	0.0463	0.0077	0.0001	0.0001	0.0200	0.0863	0.0001
Thyroid	0.5124	−0.1320	0.6988	0.0088	0.1691	−0.0569	0.4222	0.0122
Thymus	0.0004	0.0875	0.2162	0.0010	0.0005	0.0540	0.3637	0.0009
Larynx	0.4416	−0.0763	0.6352	0.0149	0.2547	−0.0365	0.5208	0.0171
Eyes	0.0042	0.0574	0.3155	0.0030	0.0068	0.0256	0.2995	0.0030
Small intestine	0.0000	0.1663	0.0810	0.0000	0.0000	0.0921	0.2090	0.0000
Esophagus	0.0127	−0.0619	0.4937	0.0006	0.0056	−0.0155	0.1152	0.0008
Marrow	0.0080	−0.0115	0.2985	0.0003	0.0073	−0.0052	0.2389	0.0003
Skin	0.0105	−0.0018	0.0073	0.0005	0.0109	−0.0029	0.0824	0.0005
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 11 Cervical spine LAT tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0061	−0.0430	0.0237	0.0019	0.0127	−0.0600	0.1531	0.0018
Body	0.0368	−0.0137	0.1165	0.0028	0.0434	−0.0163	0.6426	0.0018
Bones	0.0978	−0.0075	0.0432	0.0078	0.0881	−0.0017	0.0092	0.0079
Heart	0.0007	0.0605	0.1645	0.0009	0.0008	0.0408	0.3243	0.0008
Kidney	0.0001	0.0302	−0.0030	0.0001	0.0001	0.0130	0.0422	0.0001
Lung	0.0042	0.0337	0.0976	0.0022	0.0040	0.0263	0.2563	0.0020
Liver	0.0002	0.0932	0.2322	0.0005	0.0003	0.0484	0.3089	0.0004
Spleen	0.0000	0.1263	0.2059	0.0002	0.0001	0.0404	0.1069	0.0002
Gall bladder	0.0002	0.0540	0.0453	0.0002	0.0001	0.0433	0.2069	0.0002
Stomach	0.0001	0.0803	0.1837	0.0002	0.0001	0.0510	0.3229	0.0002
Brain	0.0364	0.0051	0.0142	0.0044	0.0302	0.0105	0.2534	0.0038
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.0919	0.2133	0.0000	0.0000	0.0445	0.2992	0.0000
Pancreas	0.0001	0.0824	0.1425	0.0002	0.0001	0.0432	0.2239	0.0001
Adrenals	0.0004	0.0201	0.0173	0.0003	0.0003	0.0243	0.0872	0.0003
Thyroid	2.3000	−0.1342	0.7368	0.0351	0.6987	−0.0553	0.4123	0.0525
Thymus	0.0020	0.0651	0.1668	0.0029	0.0022	0.0445	0.3356	0.0026
Larynx	2.0288	−0.0780	0.6589	0.0644	1.0872	−0.0350	0.4794	0.0795
Eyes	0.0173	0.0148	0.1358	0.0023	0.0190	0.0076	0.1519	0.0023
Small intestine	0.0000	0.0683	0.1053	0.0000	0.0000	0.0374	0.2140	0.0000
Esophagus	0.0590	−0.0684	0.5588	0.0024	0.0232	−0.0163	0.1182	0.0034
Marrow	0.0320	−0.0101	0.2396	0.0012	0.0293	−0.0042	0.1675	0.0013
Skin	0.0438	−0.0035	0.0317	0.0021	0.0450	−0.0036	0.1325	0.0020
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 12 Skull PA tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.5334	−0.3605	0.4642	0.0003	0.0020	−0.0430	0.1409	0.0003
Body	0.0102	0.0348	0.1747	0.0017	0.0243	−0.0074	0.1740	0.0017
Bones	0.3746	−0.0615	0.5819	0.0069	0.1275	−0.0031	0.0314	0.0106
Heart	0.0004	0.0560	0.0126	0.0007	0.0002	0.0689	0.4733	0.0005
Kidney	0.0174	−0.2685	−0.1163	0.0001	0.0001	0.0238	0.1338	0.0001
Lung	0.0021	0.0323	0.0088	0.0015	0.0010	0.0497	0.4827	0.0011
Liver	0.0001	0.0687	0.0254	0.0002	0.0001	0.0594	0.3810	0.0002
Spleen	0.0000	0.0954	0.0739	0.0001	0.0001	0.0339	0.1481	0.0001
Gall bladder	0.0007	−0.0240	0.0021	0.0002	0.0001	0.0649	0.3865	0.0002
Stomach	0.0001	0.0941	0.0396	0.0002	0.0000	0.0747	0.4771	0.0001
Brain	0.4464	−0.0261	0.3890	0.0101	0.2806	−0.0011	0.0143	0.0128
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0002	−0.0500	−0.0424	0.0000	0.0000	0.0675	0.4523	0.0000
Pancreas	0.0027	−0.1445	−0.1186	0.0001	0.0000	0.0481	0.3348	0.0001
Adrenals	0.0006	−0.0340	0.0081	0.0002	0.0001	0.0454	0.2462	0.0001
Thyroid	0.0735	−0.0322	0.1715	0.0032	0.0381	0.0017	0.0103	0.0035
Thymus	0.0009	0.0633	0.0182	0.0016	0.0005	0.0655	0.4707	0.0011
Larynx	0.5647	−0.0960	0.8430	0.0043	0.1115	−0.0070	0.0937	0.0103
Eyes	0.0485	−0.0267	0.2879	0.0014	0.0271	0.0027	0.0626	0.0016
Small intestine	0.0011	−0.1634	−0.0822	0.0000	0.0000	0.0601	0.3462	0.0000
Esophagus	0.0074	−0.0085	0.0025	0.0012	0.0035	0.0213	0.3637	0.0010
Marrow	0.0505	−0.0233	0.3685	0.0011	0.0345	−0.0023	0.0746	0.0014
Skin	0.0631	−0.0193	0.2697	0.0016	0.0435	0.0003	0.0010	0.0018
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 13 Skull LAT tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0707	−0.2248	0.1443	0.0012	0.0044	−0.0188	0.0390	0.0013
Body	0.0349	−0.0171	0.0315	0.0022	0.0361	−0.0103	0.4335	0.0017
Bones	0.5421	−0.0729	0.4966	0.0118	0.2048	−0.0036	0.0431	0.0163
Heart	0.0001	0.1554	0.0811	0.0006	0.0002	0.0647	0.5437	0.0005
Kidney	0.0001	0.0390	−0.0205	0.0001	0.0001	0.0214	0.1031	0.0001
Lung	0.0007	0.1158	0.0817	0.0013	0.0010	0.0489	0.5377	0.0009
Liver	0.0000	0.2680	0.1172	0.0003	0.0001	0.0672	0.4591	0.0002
Spleen	0.0000	0.3206	0.1467	0.0001	0.0000	0.0556	0.1645	0.0001
Gall bladder	0.0001	0.0952	−0.0114	0.0001	0.0001	0.0529	0.2899	0.0001
Stomach	0.0000	0.2069	0.0883	0.0001	0.0000	0.0651	0.4450	0.0001
Brain	0.6740	−0.0422	0.5648	0.0116	0.3867	−0.0024	0.0668	0.0170
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.3152	0.0976	0.0000	0.0000	0.0602	0.3798	0.0000
Pancreas	0.0000	0.2287	0.0221	0.0001	0.0000	0.0489	0.3575	0.0001
Adrenals	0.0001	0.1095	−0.0340	0.0002	0.0001	0.0409	0.2148	0.0001
Thyroid	0.6563	−0.1636	0.2060	0.0168	0.1430	−0.0324	0.2707	0.0161
Thymus	0.0002	0.1926	0.1172	0.0019	0.0006	0.0682	0.5747	0.0013
Larynx	2.8435	−0.1786	0.3063	0.0487	0.5850	−0.0384	0.4839	0.0420
Eyes	0.9481	−0.0362	0.4099	0.0209	0.5992	−0.0027	0.0823	0.0261
Small intestine	0.0000	0.2051	0.0058	0.0000	0.0000	0.0553	0.3240	0.0000
Esophagus	0.0107	−0.0356	0.0319	0.0011	0.0054	0.0060	0.0320	0.0011
Marrow	0.0785	−0.0342	0.5600	0.0012	0.0517	−0.0031	0.1664	0.0017
Skin	0.0889	−0.0289	0.2025	0.0029	0.0665	−0.0049	0.2221	0.0028
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 14 Hip AP tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0035	−0.1563	0.0392	0.0002	0.0002	−0.0217	0.0022	0.0002
Body	0.0871	−0.0210	0.2907	0.0051	0.0663	−0.0077	0.1284	0.0057
Bones	0.2283	−0.0668	0.7985	0.0047	0.1189	−0.0325	0.6226	0.0064
Heart	0.0005	−0.0199	0.0209	0.0002	0.0004	−0.0050	0.0016	0.0002
Kidney	0.0025	0.0190	0.0239	0.0014	0.0026	0.0134	0.0386	0.0014
Lung	0.0010	−0.0731	−0.0217	0.0001	0.0002	0.0020	−0.0030	0.0001
Liver	0.0031	−0.0555	0.0671	0.0005	0.0016	−0.0235	0.0392	0.0005
Spleen	0.0358	−0.1213	0.1343	0.0018	0.0114	−0.0605	0.1103	0.0018
Gall bladder	0.0052	−0.0480	0.0751	0.0008	0.0032	−0.0227	0.0526	0.0008
Stomach	0.0092	−0.0596	0.0626	0.0016	0.0045	−0.0240	0.0327	0.0016
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.6724	−0.0720	0.4428	0.0290	0.3492	−0.0368	0.3930	0.0303
Large intestine	0.5998	−0.0859	0.4542	0.0217	0.3415	−0.0523	0.5314	0.0201
Pancreas	0.0160	−0.0632	0.0889	0.0022	0.0079	−0.0276	0.0551	0.0022
Adrenals	0.0007	0.0192	0.0129	0.0005	0.0007	0.0155	0.0421	0.0005
Thyroid	2.1074	−0.7111	−0.2176	0.0000	0.0000	0.1951	0.1460	0.0000
Thymus	0.0004	−0.0818	−0.0412	0.0000	0.0001	0.0031	−0.0014	0.0000
Larynx	0.0000	1.5584	−0.0565	0.0000	0.0000	2.2494	−0.0110	0.0000
Eyes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Small intestine	0.7338	−0.1165	0.3178	0.0236	0.3024	−0.0663	0.3221	0.0235
Esophagus	0.0003	−0.0077	0.0037	0.0001	0.0002	0.0030	0.0012	0.0001
Marrow	0.0962	−0.0630	0.8153	0.0019	0.0525	−0.0309	0.6490	0.0027
Skin	0.0593	−0.0085	0.0470	0.0054	0.0486	0.0001	0.0000	0.0056
Ovaries	1.1803	−0.1018	0.7288	0.0223	0.4758	−0.0502	0.7234	0.0225
Uterus	0.7101	−0.0954	0.7102	0.0153	0.2806	−0.0440	0.6311	0.0172
Vagina	0.4225	−0.0622	0.5297	0.0191	0.2233	−0.0276	0.4236	0.0212
Prostate	0.1485	−0.0316	0.2230	0.0116	0.1054	−0.0147	0.1524	0.0122
Testes	0.3823	−0.0189	0.0589	0.0504	0.3034	−0.0079	0.0321	0.0511

Table 15 Hip AP tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0057	−0.1760	0.0456	0.0002	0.0002	−0.0265	0.0043	0.0002
Body	0.0990	−0.0258	0.3944	0.0051	0.0725	−0.0104	0.2072	0.0058
Bones	0.2847	−0.0753	0.8282	0.0049	0.1387	−0.0372	0.6664	0.0068
Heart	0.0008	−0.0346	0.0503	0.0002	0.0005	−0.0131	0.0148	0.0002
Kidney	0.0036	0.0067	0.0032	0.0015	0.0035	0.0067	0.0100	0.0015
Lung	0.0013	−0.0807	0.0207	0.0001	0.0002	−0.0051	0.0120	0.0001
Liver	0.0050	−0.0732	0.1072	0.0006	0.0023	−0.0328	0.0726	0.0006
Spleen	0.0579	−0.1395	0.1675	0.0019	0.0163	−0.0710	0.1434	0.0020
Gall bladder	0.0082	−0.0635	0.1227	0.0009	0.0046	−0.0322	0.0978	0.0009
Stomach	0.0135	−0.0719	0.0876	0.0017	0.0061	−0.0313	0.0532	0.0018
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.7882	−0.0798	0.4919	0.0285	0.3832	−0.0410	0.4411	0.0299
Large intestine	0.6995	−0.0917	0.4819	0.0224	0.3798	−0.0554	0.5572	0.0207
Pancreas	0.0238	−0.0766	0.1234	0.0024	0.0107	−0.0353	0.0848	0.0024
Adrenals	0.0011	0.0059	0.0003	0.0005	0.0010	0.0085	0.0139	0.0005
Thyroid	0.2738	−0.5702	−0.2427	0.0000	0.0000	0.0720	0.1046	0.0000
Thymus	0.0006	−0.0955	0.0115	0.0000	0.0001	−0.0100	0.0127	0.0000
Larynx	0.0000	1.4606	−0.0649	0.0000	0.0000	1.0413	0.0116	0.0000
Eyes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Small intestine	0.8636	−0.1212	0.3432	0.0245	0.3458	−0.0692	0.3509	0.0244
Esophagus	0.0005	−0.0231	0.0219	0.0002	0.0003	−0.0055	0.0029	0.0002
Marrow	0.1294	−0.0744	0.8610	0.0020	0.0645	−0.0373	0.7132	0.0028
Skin	0.0624	−0.0109	0.0753	0.0054	0.0501	−0.0012	0.0029	0.0056
Ovaries	1.4486	−0.1104	0.7570	0.0228	0.5373	−0.0541	0.7488	0.0232
Uterus	0.8225	−0.1029	0.7480	0.0147	0.3017	−0.0474	0.6655	0.0170
Vagina	0.4893	−0.0700	0.6037	0.0180	0.2396	−0.0311	0.4886	0.0205
Prostate	0.1942	−0.0432	0.3510	0.0114	0.1247	−0.0211	0.2637	0.0121
Testes	0.4183	−0.0243	0.0823	0.0519	0.3150	−0.0106	0.0496	0.0528

Table 16 Knee AP tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Body	0.0287	0.0090	0.0233	0.0035	0.0293	0.0042	0.0424	0.0035
Bones	0.0917	−0.0184	0.1720	0.0051	0.0794	−0.0051	0.1072	0.0053
Heart	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Kidney	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Lung	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Liver	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Spleen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Gall bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Stomach	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.0004	−0.0905	−0.0562	0.0001	0.0000	0.0597	0.0547	0.0001
Large intestine	0.0069	−0.4488	−0.1953	0.0000	0.0000	0.1807	−0.1469	0.0000
Pancreas	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Adrenals	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Thyroid	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Thymus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Larynx	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Eyes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Small intestine	0.0000	0.3003	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000
Esophagus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Marrow	0.0012	−0.0059	0.0152	0.0001	0.0011	0.0018	0.0115	0.0001
Skin	0.0465	0.0158	0.1099	0.0049	0.0476	0.0080	0.2387	0.0045
Ovaries	0.0000	0.1045	0.1778	0.0000	0.0000	0.0591	0.1805	0.0000
Uterus	0.0000	0.1250	0.2822	0.0000	0.0000	0.0622	0.3283	0.0000
Vagina	0.0002	0.0702	0.1463	0.0002	0.0003	0.0245	0.2155	0.0002
Prostate	0.0001	0.0294	−0.0207	0.0000	0.0001	0.0110	0.0417	0.0000
Testes	0.0017	0.0595	0.1072	0.0014	0.0014	0.0392	0.3332	0.0012

Table 17 Knee PA tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	1.9×10^{-8}	0.0×10^0	-1.8×10^{-15}	1.4×10^{-7}	1.9×10^{-8}	0.0×10^0	-1.8×10^{-15}	1.4×10^{-7}
Body	4.1×10^{-2}	-1.9×10^{-3}	1.3×10^{-3}	3.8×10^{-3}	4.0×10^{-2}	-7.3×10^{-4}	1.6×10^{-3}	3.8×10^{-3}
Bones	9.5×10^{-2}	-5.0×10^{-2}	5.2×10^{-1}	3.8×10^{-3}	6.8×10^{-2}	-1.6×10^{-2}	4.3×10^{-1}	4.2×10^{-3}
Heart	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Kidney	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Lung	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Liver	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Spleen	1.9×10^{-8}	0.0×10^0	-3.3×10^{-15}	1.4×10^{-7}	1.9×10^{-8}	0.0×10^0	-3.3×10^{-15}	1.4×10^{-7}
Gall bladder	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Stomach	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Brain	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Bladder	4.6×10^{-4}	-1.1×10^{-1}	-6.9×10^{-2}	6.8×10^{-5}	1.8×10^{-5}	5.7×10^{-2}	6.1×10^{-2}	6.4×10^{-5}
Large intestine	1.8×10^{-1}	-6.8×10^{-1}	-1.7×10^{-1}	2.0×10^{-5}	5.9×10^{-6}	3.5×10^{-2}	-1.5×10^{-2}	1.9×10^{-5}
Pancreas	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Adrenals	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Thyroid	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Thymus	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Larynx	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Eyes	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Small intestine	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Esophagus	0.0×10^0	0.0×10^0		0.0×10^0	0.0×10^0	0.0×10^0		0.0×10^0
Marrow	1.6×10^{-3}	-3.4×10^{-2}	4.1×10^{-1}	6.7×10^{-5}	1.2×10^{-3}	-7.8×10^{-3}	1.9×10^{-1}	7.9×10^{-5}
Skin	5.1×10^{-2}	9.0×10^{-3}	3.6×10^{-2}	5.0×10^{-3}	5.0×10^{-2}	5.7×10^{-3}	1.2×10^{-1}	4.8×10^{-3}
Ovaries	1.3×10^{-5}	1.0×10^{-1}	1.9×10^{-1}	2.3×10^{-5}	1.1×10^{-5}	5.8×10^{-2}	2.4×10^{-1}	2.2×10^{-5}
Uterus	1.9×10^{-5}	1.1×10^{-1}	2.2×10^{-1}	4.0×10^{-5}	2.0×10^{-5}	5.8×10^{-2}	3.2×10^{-1}	3.7×10^{-5}
Vagina	2.2×10^{-4}	6.1×10^{-2}	1.2×10^{-1}	2.0×10^{-4}	2.8×10^{-4}	2.4×10^{-2}	2.2×10^{-1}	1.8×10^{-4}
Prostate	1.3×10^{-4}	6.0×10^{-3}	-7.5×10^{-3}	4.4×10^{-5}	1.2×10^{-4}	5.7×10^{-3}	1.9×10^{-2}	4.3×10^{-5}
Testes	2.1×10^{-3}	-8.5×10^{-3}	2.1×10^{-3}	4.9×10^{-4}	1.4×10^{-3}	9.8×10^{-3}	3.1×10^{-2}	4.8×10^{-4}

Table 18 Lumbar spine AP tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0074	-0.0396	0.0697	0.0017	0.0072	-0.0356	0.0887	0.0016
Body	0.0474	-0.0138	0.1645	0.0040	0.0449	-0.0107	0.1829	0.0040
Bones	0.2446	-0.0962	0.9059	0.0027	0.1297	-0.0647	0.6686	0.0052
Heart	0.2232	-0.0827	0.2030	0.0193	0.3033	-0.0890	0.3443	0.0175
Kidney	0.7604	-0.0913	0.7895	0.0143	0.4162	-0.0613	0.6249	0.0190
Lung	0.0586	-0.0726	0.2609	0.0048	0.0706	-0.0746	0.4179	0.0042
Liver	1.4108	-0.1063	0.3809	0.0561	1.7306	-0.1076	0.5327	0.0487
Spleen	3.0644	-0.1079	0.3781	0.1196	2.8113	-0.0973	0.4485	0.1126
Gall bladder	0.3637	-0.1009	0.4742	0.0131	0.3785	-0.0958	0.6050	0.0114
Stomach	1.4691	-0.0775	0.3077	0.1018	1.7512	-0.0787	0.4989	0.0866
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.0351	-0.0145	0.0138	0.0121	0.0340	-0.0121	0.0163	0.0120
Large intestine	1.6461	-0.0823	0.7637	0.0380	1.1729	-0.0632	0.7577	0.0384
Pancreas	1.8492	-0.0828	0.5768	0.0664	1.4991	-0.0687	0.6523	0.0601
Adrenals	0.4451	-0.0769	0.6163	0.0155	0.2746	-0.0526	0.5218	0.0173
Thyroid	0.0004	0.0071	0.0027	0.0002	0.0003	0.0119	0.0175	0.0002
Thymus	0.0143	-0.0472	0.1281	0.0022	0.0163	-0.0484	0.2306	0.0021
Larynx	0.0002	0.0067	0.0051	0.0001	0.0002	0.0101	0.0150	0.0001
Eyes	0.0000	0.0613	0.0504	0.0000	0.0000	0.0210	0.0007	0.0000
Small intestine	1.8109	-0.0628	0.6588	0.0660	1.4856	-0.0505	0.7434	0.0572
Esophagus	0.1554	-0.0869	0.2591	0.0107	0.1562	-0.0810	0.3498	0.0101
Marrow	0.1650	-0.0978	0.8955	0.0019	0.0817	-0.0634	0.6332	0.0036
Skin	0.0431	-0.0209	0.5161	0.0020	0.0397	-0.0162	0.5675	0.0019
Ovaries	0.0956	-0.0408	0.1798	0.0131	0.0669	-0.0229	0.1254	0.0135
Uterus	0.1178	-0.0571	0.2798	0.0112	0.0628	-0.0271	0.1454	0.0122
Vagina	0.0101	-0.0174	0.0610	0.0018	0.0081	-0.0071	0.0239	0.0019
Prostate	0.0458	-0.0667	0.3674	0.0026	0.0262	-0.0418	0.2400	0.0028
Testes	0.0013	-0.0039	0.0013	0.0005	0.0013	-0.0036	0.0020	0.0005

Table 19 Lumbar spine LAT tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0077	−0.0527	0.0792	0.0009	0.0031	−0.0323	0.0522	0.0009
Body	0.0602	−0.0136	0.2028	0.0039	0.0507	−0.0107	0.2413	0.0038
Bones	0.2525	−0.0518	0.7147	0.0054	0.1195	−0.0375	0.6701	0.0058
Heart	0.0875	−0.0762	0.3295	0.0029	0.0394	−0.0669	0.3954	0.0027
Kidney	2.7720	−0.0769	0.6790	0.0413	1.0034	−0.0593	0.6917	0.0405
Lung	0.1394	−0.0714	0.1814	0.0075	0.0663	−0.0628	0.2266	0.0073
Liver	1.9947	−0.0752	0.4511	0.0513	0.8927	−0.0654	0.5427	0.0468
Spleen	5.7932	−0.1285	0.3240	0.0583	2.4557	−0.1345	0.3939	0.0552
Gall bladder	0.1822	−0.0879	0.5226	0.0031	0.0606	−0.0703	0.5146	0.0032
Stomach	0.2568	−0.0903	0.5273	0.0042	0.0804	−0.0710	0.5055	0.0043
Brain	0.0000	−0.0671	−0.0011	0.0000	0.0000	−0.1133	−0.0362	0.0000
Bladder	0.0153	−0.0250	0.0844	0.0020	0.0087	−0.0105	0.0288	0.0021
Large intestine	0.5073	−0.0762	0.2706	0.0182	0.1396	−0.0478	0.1977	0.0191
Pancreas	0.7636	−0.0873	0.5331	0.0129	0.2271	−0.0652	0.4755	0.0137
Adrenals	0.9121	−0.0685	0.3908	0.0297	0.4030	−0.0562	0.4537	0.0281
Thyroid	0.0005	0.0098	0.0068	0.0002	0.0004	0.0170	0.0610	0.0002
Thymus	0.0172	−0.0505	0.1904	0.0013	0.0102	−0.0443	0.2328	0.0013
Larynx	0.0002	0.0144	0.0150	0.0001	0.0002	0.0196	0.0780	0.0001
Eyes	0.0000	0.0189	−0.0376	0.0000	0.0000	0.0198	−0.0408	0.0000
Small intestine	0.4554	−0.0831	0.4774	0.0092	0.1143	−0.0532	0.3321	0.0104
Esophagus	0.0985	−0.0681	0.2548	0.0046	0.0476	−0.0591	0.3081	0.0044
Marrow	0.1546	−0.0525	0.8248	0.0024	0.0696	−0.0365	0.7201	0.0030
Skin	0.1142	−0.0369	0.5814	0.0039	0.0724	−0.0295	0.6823	0.0034
Ovaries	0.0204	−0.0116	0.0146	0.0054	0.0127	0.0032	0.0026	0.0054
Uterus	0.0200	−0.0165	0.0373	0.0039	0.0113	0.0007	0.0002	0.0039
Vagina	0.0033	0.0064	0.0064	0.0014	0.0026	0.0157	0.0844	0.0013
Prostate	0.0109	−0.0296	0.1272	0.0011	0.0072	−0.0222	0.1116	0.0011
Testes	0.0006	−0.0215	0.0977	0.0001	0.0006	−0.0249	0.0354	0.0001

Table 20 Thoracic spine AP tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	26.172	−0.225	0.334	0.118	2.153	−0.104	0.202	0.129
Body	0.058	−0.023	0.222	0.004	0.045	−0.010	0.176	0.004
Bones	0.253	−0.052	0.572	0.009	0.160	−0.029	0.631	0.008
Heart	1.109	−0.047	0.537	0.042	0.739	−0.026	0.599	0.039
Kidney	0.253	−0.101	0.172	0.012	0.046	−0.024	0.042	0.013
Lung	0.910	−0.061	0.734	0.021	0.505	−0.032	0.722	0.022
Liver	0.407	−0.043	0.145	0.040	0.226	−0.016	0.074	0.042
Spleen	0.204	−0.044	0.015	0.064	0.076	−0.002	0.000	0.065
Gall bladder	0.410	−0.105	0.436	0.011	0.102	−0.040	0.240	0.012
Stomach	0.208	0.001	0.000	0.075	0.206	0.001	0.000	0.075
Brain	0.001	−0.006	0.006	0.000	0.001	0.002	0.002	0.000
Bladder	0.000	0.048	0.058	0.000	0.000	0.020	0.062	0.000
Large intestine	0.004	0.083	0.131	0.020	0.008	0.050	0.177	0.020
Pancreas	0.116	−0.004	0.001	0.050	0.083	0.008	0.009	0.049
Adrenals	0.490	−0.089	0.325	0.019	0.136	−0.031	0.151	0.021
Thyroid	4.460	−0.100	0.570	0.100	1.482	−0.047	0.451	0.113
Thymus	1.114	−0.039	0.467	0.050	0.793	−0.022	0.536	0.047
Larynx	0.581	−0.067	0.177	0.047	0.226	−0.024	0.081	0.050
Eyes	0.001	0.042	0.229	0.000	0.001	0.025	0.296	0.000
Small intestine	0.009	0.055	0.068	0.019	0.010	0.042	0.152	0.018
Esophagus	1.356	−0.086	0.843	0.018	0.520	−0.040	0.672	0.025
Marrow	0.161	−0.056	0.768	0.004	0.089	−0.027	0.671	0.004
Skin	0.066	−0.028	0.418	0.003	0.049	−0.014	0.381	0.003
Ovaries	0.000	0.061	0.121	0.000	0.000	0.026	0.111	0.000
Uterus	0.000	0.061	0.135	0.000	0.000	0.027	0.128	0.000
Vagina	0.000	0.061	0.251	0.000	0.000	0.040	0.222	0.000
Prostate	0.000	0.027	0.004	0.000	0.000	−0.006	−0.004	0.000
Testes	0.000	−0.030	0.003	0.000	0.001	−0.151	0.103	0.000

Table 21 Thoracic spine AP tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	26.2371	−0.2247	0.3350	0.1174	2.1614	−0.1046	0.2030	0.1286
Body	0.0590	−0.0224	0.2286	0.0038	0.0460	−0.0104	0.1859	0.0039
Bones	0.2529	−0.0515	0.5704	0.0090	0.1605	−0.0284	0.6331	0.0084
Heart	1.1104	−0.0467	0.5389	0.0422	0.7395	−0.0260	0.6021	0.0392
Kidney	0.2669	−0.1010	0.1775	0.0128	0.0486	−0.0250	0.0459	0.0138
Lung	0.9095	−0.0612	0.7339	0.0211	0.5058	−0.0321	0.7235	0.0215
Liver	0.4380	−0.0454	0.1682	0.0393	0.2403	−0.0176	0.0950	0.0410
Spleen	0.2097	−0.0428	0.0151	0.0664	0.0828	−0.0032	0.0004	0.0669
Gall bladder	0.4285	−0.1057	0.4539	0.0105	0.1063	−0.0408	0.2571	0.0122
Stomach	0.2341	−0.0028	0.0006	0.0729	0.2256	−0.0011	0.0003	0.0729
Brain	0.0008	−0.0038	0.0024	0.0002	0.0007	0.0031	0.0051	0.0002
Bladder	0.0001	0.0495	0.0632	0.0002	0.0002	0.0205	0.0647	0.0002
Large intestine	0.0052	0.0783	0.1283	0.0209	0.0094	0.0466	0.1654	0.0205
Pancreas	0.1311	−0.0071	0.0018	0.0497	0.0952	0.0055	0.0042	0.0497
Adrenals	0.4970	−0.0888	0.3439	0.0187	0.1428	−0.0315	0.1701	0.0210
Thyroid	4.2540	−0.0953	0.6111	0.0930	1.5233	−0.0455	0.5073	0.1047
Thymus	1.1138	−0.0394	0.4682	0.0498	0.7924	−0.0220	0.5370	0.0464
Larynx	0.5668	−0.0593	0.1794	0.0481	0.2518	−0.0220	0.0911	0.0506
Eyes	0.0007	0.0423	0.2445	0.0004	0.0009	0.0252	0.3132	0.0004
Small intestine	0.0096	0.0535	0.0694	0.0193	0.0112	0.0406	0.1478	0.0185
Esophagus	1.3549	−0.0858	0.8493	0.0172	0.5237	−0.0400	0.6824	0.0249
Marrow	0.1613	−0.0557	0.7714	0.0035	0.0899	−0.0272	0.6797	0.0041
Skin	0.0664	−0.0282	0.4327	0.0030	0.0498	−0.0141	0.4001	0.0030
Ovaries	0.0002	0.0604	0.1218	0.0004	0.0003	0.0261	0.1120	0.0004
Uterus	0.0001	0.0615	0.1423	0.0003	0.0003	0.0276	0.1367	0.0003
Vagina	0.0000	0.0592	0.2512	0.0001	0.0000	0.0422	0.2319	0.0001
Prostate	0.0001	0.0308	0.0005	0.0000	0.0001	−0.0066	−0.0033	0.0000
Testes	0.0001	−0.0536	0.0022	0.0001	0.0008	−0.1303	0.0921	0.0001

Table 22 Thoracic spine LAT tomosynthesis with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.2675	−0.0826	0.1560	0.0057	0.0397	−0.0446	0.1766	0.0057
Body	0.1407	−0.0330	0.4501	0.0039	0.0613	−0.0153	0.3594	0.0042
Bones	0.6843	−0.0533	0.6524	0.0095	0.1832	−0.0256	0.5584	0.0107
Heart	2.3111	−0.0959	0.4670	0.0172	0.2759	−0.0552	0.5349	0.0161
Kidney	0.0965	−0.0329	0.0298	0.0147	0.0244	0.0047	0.0020	0.0149
Lung	2.1871	−0.0669	0.5831	0.0265	0.4473	−0.0345	0.5743	0.0268
Liver	0.2938	−0.0226	0.0228	0.0519	0.1626	−0.0097	0.0153	0.0521
Spleen	0.0651	−0.0276	0.0148	0.0146	0.0279	−0.0072	0.0036	0.0147
Gall bladder	0.2186	−0.0632	0.3110	0.0051	0.0369	−0.0221	0.1446	0.0057
Stomach	0.1320	−0.0488	0.1658	0.0062	0.0428	−0.0264	0.1750	0.0062
Brain	0.0034	−0.0430	0.1139	0.0002	0.0007	−0.0011	0.0005	0.0002
Bladder	0.0005	−0.0297	0.0157	0.0001	0.0001	0.0093	0.0124	0.0001
Large intestine	0.0081	−0.0107	0.0040	0.0027	0.0040	0.0109	0.0152	0.0026
Pancreas	0.1069	−0.0432	0.0740	0.0090	0.0356	−0.0195	0.0530	0.0091
Adrenals	1.1856	−0.0744	0.2142	0.0278	0.1812	−0.0342	0.1484	0.0290
Thyroid	0.0240	−0.0108	0.0110	0.0043	0.0095	0.0187	0.1269	0.0040
Thymus	0.6309	−0.0677	0.4623	0.0096	0.1308	−0.0362	0.4753	0.0095
Larynx	0.0108	−0.0088	0.0074	0.0021	0.0046	0.0191	0.1361	0.0019
Eyes	0.0013	−0.0247	0.0818	0.0001	0.0005	0.0009	−0.0001	0.0001
Small intestine	0.0226	−0.0379	0.0667	0.0022	0.0059	−0.0035	0.0021	0.0022
Esophagus	2.5128	−0.0774	0.5329	0.0261	0.3862	−0.0386	0.4864	0.0273
Marrow	0.4448	−0.0605	0.6611	0.0053	0.1038	−0.0306	0.6204	0.0056
Skin	0.3130	−0.0521	0.5559	0.0054	0.0818	−0.0230	0.4083	0.0062
Ovaries	0.0003	0.0083	0.0055	0.0002	0.0002	0.0199	0.0575	0.0002
Uterus	0.0002	0.0182	0.0111	0.0002	0.0001	0.0327	0.0960	0.0002
Vagina	0.0000	0.0340	0.0022	0.0001	0.0000	0.0380	0.1554	0.0000
Prostate	0.0011	−0.0727	0.0648	0.0000	0.0001	−0.0147	0.0440	0.0000
Testes	1.91×10^{-4}	−5.3558	−0.08467	1.52×10^{-6}	1.96×10^{-15}	−2.40546	−0.01103	1.47×10^{-6}

Table 23 Thoracic spine LAT tomosynthesis with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.2666	−0.0826	0.1569	0.0057	0.0397	−0.0446	0.1778	0.0056
Body	0.1411	−0.0328	0.4549	0.0039	0.0618	−0.0152	0.3650	0.0042
Bones	0.6845	−0.0532	0.6515	0.0096	0.1844	−0.0256	0.5609	0.0107
Heart	2.3237	−0.0961	0.4694	0.0172	0.2761	−0.0553	0.5374	0.0160
Kidney	0.1110	−0.0347	0.0342	0.0155	0.0283	0.0021	0.0004	0.0158
Lung	2.2009	−0.0671	0.5849	0.0265	0.4477	−0.0346	0.5761	0.0268
Liver	0.3158	−0.0238	0.0270	0.0514	0.1734	−0.0111	0.0213	0.0516
Spleen	0.0744	−0.0301	0.0166	0.0157	0.0308	−0.0094	0.0058	0.0158
Gall bladder	0.2242	−0.0637	0.3204	0.0051	0.0375	−0.0225	0.1513	0.0057
Stomach	0.1365	−0.0495	0.1726	0.0062	0.0437	−0.0269	0.1833	0.0061
Brain	0.0035	−0.0419	0.1144	0.0002	0.0007	−0.0008	0.0004	0.0002
Bladder	0.0006	−0.0293	0.0171	0.0001	0.0001	0.0086	0.0114	0.0001
Large intestine	0.0086	−0.0114	0.0046	0.0028	0.0042	0.0101	0.0131	0.0027
Pancreas	0.1130	−0.0440	0.0774	0.0091	0.0373	−0.0203	0.0588	0.0092
Adrenals	1.2481	−0.0748	0.2322	0.0275	0.1944	−0.0354	0.1724	0.0285
Thyroid	0.0247	−0.0113	0.0121	0.0043	0.0096	0.0185	0.1243	0.0041
Thymus	0.6318	−0.0678	0.4625	0.0096	0.1309	−0.0363	0.4765	0.0095
Larynx	0.0113	−0.0095	0.0086	0.0021	0.0047	0.0189	0.1321	0.0020
Eyes	0.0013	−0.0247	0.0768	0.0001	0.0005	0.0008	−0.0001	0.0001
Small intestine	0.0238	−0.0385	0.0699	0.0022	0.0062	−0.0042	0.0032	0.0023
Esophagus	2.5201	−0.0776	0.5346	0.0260	0.3862	−0.0387	0.4882	0.0272
Marrow	0.4455	−0.0604	0.6632	0.0052	0.1045	−0.0306	0.6257	0.0055
Skin	0.3129	−0.0518	0.5589	0.0054	0.0827	−0.0229	0.4130	0.0062
Ovaries	0.0003	0.0053	0.0041	0.0002	0.0002	0.0197	0.0581	0.0002
Uterus	0.0002	0.0178	0.0120	0.0002	0.0001	0.0329	0.1005	0.0002
Vagina	0.0000	0.0357	0.0042	0.0001	0.0000	0.0393	0.1593	0.0001
Prostate	0.0017	−0.0830	0.0801	0.0000	0.0001	−0.0193	0.0678	0.0000
Testes	1.56×10^{77}	−5.53007	0.075555	1.22×10^{-6}	1.25×10^{15}	−2.40355	−0.07915	1.31×10^{-6}

Appendix B: Radiography Coefficient Tables

Tables 24 to 42 contain a complete list of all fitting tables for radiography.

Table 24 Abdomen AP radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0003	−0.0421	0.0227	0.0001	0.0001	0.0052	−0.0097	0.0001
Body	0.0022	−0.0057	0.0240	0.0002	0.0020	−0.0015	0.0033	0.0002
Bones	0.0136	−0.0849	0.8826	0.0002	0.0065	−0.0504	0.7321	0.0003
Heart	0.0051	−0.0814	0.1617	0.0005	0.0042	−0.0680	0.2170	0.0004
Kidney	0.0085	−0.0442	0.3865	0.0005	0.0057	−0.0256	0.3250	0.0005
Lung	0.0033	−0.0879	0.2093	0.0002	0.0027	−0.0738	0.2849	0.0002
Liver	0.0493	−0.1028	0.4157	0.0016	0.0303	−0.0768	0.4978	0.0015
Spleen	0.0220	−0.0361	0.1524	0.0025	0.0188	−0.0271	0.2114	0.0024
Gall bladder	0.0170	−0.0898	0.4422	0.0006	0.0104	−0.0644	0.4841	0.0006
Stomach	0.0558	−0.0941	0.3830	0.0023	0.0343	−0.0685	0.4485	0.0021
Brain	0.0000	−0.0807	−0.0090	0.0000	0.0082	−0.6601	−0.1242	0.0000
Bladder	0.0287	−0.0667	0.4972	0.0012	0.0180	−0.0438	0.5238	0.0012
Large intestine	0.0380	−0.0570	0.6431	0.0013	0.0260	−0.0382	0.6969	0.0012
Pancreas	0.0318	−0.0695	0.5014	0.0013	0.0197	−0.0458	0.5203	0.0013

Table 24 (Continued).

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Adrenals	0.0065	−0.0514	0.3785	0.0004	0.0038	−0.0276	0.2715	0.0004
Thyroid	0.0000	0.0103	0.0057	0.0000	0.0000	0.0223	0.0241	0.0000
Thymus	0.0008	−0.0735	0.0921	0.0001	0.0003	−0.0345	0.1298	0.0001
Larynx	0.0000	0.0077	0.0062	0.0000	0.0000	0.0234	0.0301	0.0000
Eyes	0.0000	0.0051	0.0052	0.0000	0.0000	0.0375	0.0175	0.0000
Small intestine	0.0307	−0.0413	0.4152	0.0018	0.0250	−0.0303	0.5469	0.0015
Esophagus	0.0047	−0.0896	0.2430	0.0003	0.0029	−0.0644	0.2756	0.0003
Marrow	0.0068	−0.0821	0.8885	0.0001	0.0032	−0.0472	0.7069	0.0001
Skin	0.0029	−0.0206	0.2814	0.0002	0.0025	−0.0127	0.2559	0.0002
Ovaries	0.0473	−0.0975	0.8508	0.0007	0.0221	−0.0586	0.8158	0.0007
Uterus	0.0369	−0.0958	0.8564	0.0005	0.0158	−0.0535	0.7374	0.0007
Vagina	0.0098	−0.0751	0.6749	0.0003	0.0049	−0.0408	0.5850	0.0003
Prostate	0.0141	−0.0781	0.5555	0.0004	0.0059	−0.0407	0.3592	0.0005
Testes	0.0005	−0.0272	0.0872	0.0001	0.0005	−0.0264	0.1252	0.0001

Table 25 Chest AP radiography table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Breast	0.0195	0.0021	0.0013	0.0032	0.0238	−0.0053	0.0343	0.0031
Body	0.0027	−0.0177	0.2160	0.0002	0.0024	−0.0108	0.3110	0.0001
Bones	0.0091	−0.0362	0.4623	0.0004	0.0067	−0.0211	0.6155	0.0003
Heart	0.0194	−0.0161	0.2006	0.0011	0.0175	−0.0104	0.3361	0.0010
Kidney	0.0085	−0.0775	0.2858	0.0004	0.0040	−0.0413	0.3093	0.0004
Lung	0.0197	−0.0270	0.3486	0.0010	0.0162	−0.0168	0.5310	0.0008
Liver	0.0130	−0.0251	0.1558	0.0011	0.0106	−0.0148	0.2118	0.0010
Spleen	0.0013	0.0370	0.0250	0.0023	0.0021	0.0158	0.0166	0.0023
Gall bladder	0.0166	−0.0666	0.3564	0.0008	0.0092	−0.0377	0.4216	0.0008
Stomach	0.0071	0.0046	0.0025	0.0019	0.0095	−0.0065	0.0209	0.0019
Brain	0.0000	0.0179	0.0547	0.0000	0.0000	0.0176	0.1426	0.0000
Bladder	0.0000	0.0284	−0.0029	0.0000	0.0000	−0.0133	0.0054	0.0000
Large intestine	0.0003	0.0588	0.1756	0.0005	0.0007	0.0257	0.1194	0.0006
Pancreas	0.0059	−0.0181	0.0208	0.0012	0.0058	−0.0154	0.0584	0.0012
Adrenals	0.0157	−0.0700	0.3947	0.0006	0.0074	−0.0349	0.3774	0.0007
Thyroid	0.0190	−0.0307	0.0841	0.0024	0.0109	−0.0069	0.0177	0.0025
Thymus	0.0228	−0.0175	0.1994	0.0014	0.0204	−0.0115	0.3443	0.0012
Larynx	0.0011	0.0337	0.1125	0.0006	0.0012	0.0255	0.2587	0.0006
Eyes	0.0000	0.0570	0.3909	0.0000	0.0001	0.0343	0.5186	0.0000
Small intestine	0.0007	0.0264	0.0384	0.0005	0.0009	0.0099	0.0181	0.0005
Esophagus	0.0246	−0.0519	0.7465	0.0006	0.0136	−0.0245	0.6622	0.0006
Marrow	0.0061	−0.0398	0.6244	0.0002	0.0041	−0.0214	0.7158	0.0002
Skin	0.0033	−0.0314	0.2469	0.0002	0.0030	−0.0249	0.5951	0.0002
Ovaries	0.0001	−0.0112	−0.0208	0.0000	0.0001	−0.0071	0.0033	0.0000
Uterus	0.0000	0.0056	0.0114	0.0000	0.0000	−0.0013	−0.0019	0.0000
Vagina	0.0000	0.0140	0.0480	0.0000	0.0000	0.0024	0.0055	0.0000
Prostate	0.0000	−0.0197	0.0026	0.0000	0.0000	−0.0314	0.0779	0.0000
Testes	0.0000	−0.0917	−0.0134	0.0000	0.0000	−0.0640	0.1085	0.0000

Table 26 Chest LAT radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0007	0.0353	0.2213	0.0005	0.0019	0.0140	0.1186	0.0006
Body	0.0006	−0.0109	0.1215	0.0000	0.0004	−0.0032	0.0580	0.0000
Bones	0.0026	−0.0293	0.4093	0.0001	0.0013	−0.0142	0.3152	0.0001
Heart	0.0183	−0.0666	0.5430	0.0003	0.0043	−0.0385	0.5658	0.0003
Kidney	0.0150	−0.1004	0.3597	0.0001	0.0014	−0.0497	0.2945	0.0001
Lung	0.0100	−0.0431	0.5178	0.0002	0.0036	−0.0217	0.4270	0.0003
Liver	0.0054	−0.0239	0.1155	0.0004	0.0034	−0.0154	0.1544	0.0004
Spleen	0.0002	0.0396	0.0304	0.0007	0.0006	0.0144	0.0133	0.0007
Gall bladder	0.0039	−0.0726	0.5178	0.0001	0.0006	−0.0302	0.2917	0.0001
Stomach	0.0022	−0.0385	0.2016	0.0001	0.0009	−0.0217	0.1917	0.0001
Brain	0.0000	−0.0018	−0.0026	0.0000	0.0000	0.0212	0.1893	0.0000
Bladder	0.0000	−0.0512	0.0763	0.0000	0.0000	−0.0189	0.0175	0.0000
Large intestine	0.0001	0.0184	0.0099	0.0001	0.0002	−0.0012	−0.0062	0.0001
Pancreas	0.0033	−0.0507	0.1733	0.0001	0.0009	−0.0220	0.1491	0.0001
Adrenals	0.0382	−0.1017	0.5100	0.0002	0.0036	−0.0525	0.4258	0.0003
Thyroid	0.0006	−0.0138	0.0303	0.0001	0.0003	0.0094	0.0450	0.0001
Thymus	0.0171	−0.0605	0.4031	0.0004	0.0048	−0.0366	0.4558	0.0004
Larynx	0.0002	0.0043	0.0006	0.0000	0.0001	0.0190	0.1866	0.0000
Eyes	0.0000	0.0155	0.0532	0.0000	0.0000	0.0288	0.3552	0.0000
Small intestine	0.0007	−0.0410	0.1014	0.0000	0.0002	−0.0148	0.0157	0.0001
Esophagus	0.0118	−0.0579	0.5470	0.0002	0.0028	−0.0268	0.3795	0.0002
Marrow	0.0031	−0.0481	0.6587	0.0001	0.0009	−0.0226	0.5164	0.0001
Skin	0.0008	−0.0137	0.1713	0.0000	0.0005	−0.0053	0.1116	0.0000
Ovaries	0.0000	−0.0444	0.0010	0.0000	0.0000	−0.0079	0.0057	0.0000
Uterus	0.0000	−0.0499	−0.0147	0.0000	0.0000	−0.0081	0.0035	0.0000
Vagina	0.0000	−0.0502	0.0832	0.0000	0.0000	−0.0158	0.0092	0.0000
Prostate	0.0003	−0.1278	0.1888	0.0000	0.0000	−0.0306	0.0952	0.0000
Testes	1.64×10^{69}	−5.12332	−0.18454	6.03×10^{-7}	7.31×10^{15}	−2.50599	−0.21496	6.11×10^{-7}

Table 27 Chest PA radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0052	−0.0952	0.6087	0.0001	0.0025	−0.0585	0.7592	0.0001
Body	0.0008	−0.0194	0.2106	0.0000	0.0007	−0.0098	0.3437	0.0000
Bones	0.0027	−0.0237	0.3612	0.0001	0.0021	−0.0121	0.3775	0.0001
Heart	0.0038	−0.0411	0.5051	0.0001	0.0021	−0.0144	0.2509	0.0002
Kidney	0.0054	−0.0899	0.2400	0.0003	0.0032	−0.0616	0.3494	0.0002
Lung	0.0054	−0.0294	0.5118	0.0002	0.0037	−0.0123	0.3648	0.0002
Liver	0.0026	−0.0334	0.2171	0.0002	0.0019	−0.0168	0.2119	0.0002
Spleen	0.0008	−0.0320	0.0112	0.0001	0.0005	−0.0106	0.0273	0.0001
Gall bladder	0.0038	−0.0238	0.0721	0.0005	0.0031	−0.0131	0.0865	0.0005
Stomach	0.0023	−0.0337	0.1726	0.0002	0.0015	−0.0131	0.1004	0.0002
Brain	0.0000	0.0159	0.0237	0.0000	0.0000	0.0181	0.1207	0.0000
Bladder	0.0000	0.0198	−0.0075	0.0000	0.0000	−0.0111	0.0158	0.0000
Large intestine	0.0002	0.0038	0.0057	0.0001	0.0002	−0.0028	−0.0115	0.0001
Pancreas	0.0016	−0.0343	0.0910	0.0002	0.0013	−0.0220	0.1374	0.0002
Adrenals	0.0101	−0.0727	0.3320	0.0005	0.0058	−0.0452	0.4561	0.0004
Thyroid	0.0003	0.0279	0.0569	0.0002	0.0004	0.0217	0.2248	0.0001
Thymus	0.0023	−0.0323	0.3674	0.0001	0.0014	−0.0107	0.1433	0.0001
Larynx	0.0001	0.0404	0.1387	0.0001	0.0001	0.0286	0.3368	0.0001
Eyes	0.0000	0.0208	0.0328	0.0000	0.0000	0.0165	0.1361	0.0000
Small intestine	0.0003	−0.0237	−0.0035	0.0001	0.0003	−0.0124	−0.0005	0.0001
Esophagus	0.0024	−0.0162	0.1845	0.0001	0.0018	−0.0045	0.0682	0.0001
Marrow	0.0017	−0.0251	0.3711	0.0001	0.0013	−0.0134	0.4190	0.0001
Skin	0.0008	−0.0285	0.2492	0.0001	0.0006	−0.0157	0.4087	0.0000
Ovaries	0.0000	0.0097	0.0153	0.0000	0.0000	−0.0067	−0.0086	0.0000
Uterus	0.0000	0.0027	0.0050	0.0000	0.0000	−0.0070	−0.0069	0.0000
Vagina	0.0000	−0.0120	−0.0279	0.0000	0.0000	−0.0075	0.0113	0.0000
Prostate	0.0000	−0.0227	0.0064	0.0000	0.0000	−0.0327	0.0894	0.0000
Testes	0.0000	1.1378	−0.2308	0.0000	0.0000	0.9058	−0.2308	0.0000

Table 28 Cervical spine AP radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0044	−0.2359	0.3473	0.0000	0.0002	−0.0326	0.1083	0.0000
Body	0.0008	−0.0419	0.3345	0.0000	0.0005	−0.0121	0.4391	0.0000
Bones	0.0030	−0.0452	0.3662	0.0001	0.0015	−0.0043	0.0480	0.0001
Heart	0.0000	0.1539	0.0827	0.0001	0.0000	0.0553	0.3834	0.0000
Kidney	0.0000	−0.0171	0.0209	0.0000	0.0000	0.0115	0.0270	0.0000
Lung	0.0002	0.0379	−0.0237	0.0001	0.0002	0.0250	0.1557	0.0001
Liver	0.0000	0.1224	0.0912	0.0000	0.0000	0.0439	0.3160	0.0000
Spleen	0.0000	0.1233	0.0993	0.0000	0.0000	0.0295	0.1115	0.0000
Gall bladder	0.0000	0.0512	−0.0103	0.0000	0.0000	0.0366	0.1938	0.0000
Stomach	0.0000	0.1260	0.0973	0.0000	0.0000	0.0452	0.3393	0.0000
Brain	0.0003	0.0074	−0.0579	0.0000	0.0003	0.0072	0.0540	0.0000
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.1517	0.1035	0.0000	0.0000	0.0492	0.3283	0.0000
Pancreas	0.0000	0.1221	0.0096	0.0000	0.0000	0.0379	0.2208	0.0000
Adrenals	0.0000	−0.0167	0.0094	0.0000	0.0000	0.0210	0.0771	0.0000
Thyroid	0.0582	−0.0891	0.2904	0.0024	0.0314	−0.0348	0.6250	0.0018
Thymus	0.0000	0.2320	0.1209	0.0002	0.0000	0.0815	0.4365	0.0002
Larynx	0.0318	−0.0632	0.3584	0.0013	0.0206	−0.0248	0.7489	0.0008
Eyes	0.0007	0.0141	0.0339	0.0001	0.0006	0.0120	0.3661	0.0001
Small intestine	0.0000	0.0998	−0.0137	0.0000	0.0000	0.0408	0.2286	0.0000
Esophagus	0.0088	−0.1085	0.3416	0.0003	0.0030	−0.0307	0.3729	0.0003
Marrow	0.0007	−0.0235	0.3194	0.0000	0.0005	−0.0057	0.1781	0.0000
Skin	0.0007	−0.0143	0.1054	0.0000	0.0006	−0.0039	0.0778	0.0000
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 29 Cervical spine LAT radiography with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0002	−0.0573	0.0363	0.0000	0.0001	−0.0302	0.1028	0.0000
Body	0.0007	−0.0059	0.0101	0.0001	0.0008	−0.0071	0.1530	0.0001
Bones	0.0018	0.0059	0.0221	0.0002	0.0016	0.0079	0.1585	0.0002
Heart	0.0000	0.0800	0.1528	0.0000	0.0000	0.0522	0.4777	0.0000
Kidney	0.0000	0.0287	−0.0043	0.0000	0.0000	0.0225	0.1104	0.0000
Lung	0.0001	0.0327	0.0636	0.0001	0.0001	0.0386	0.4323	0.0000
Liver	0.0000	0.0965	0.2105	0.0000	0.0000	0.0519	0.4045	0.0000
Spleen	0.0000	0.1237	0.2204	0.0000	0.0000	0.0345	0.1347	0.0000
Gall bladder	0.0000	0.0552	0.0368	0.0000	0.0000	0.0499	0.2911	0.0000
Stomach	0.0000	0.0812	0.1612	0.0000	0.0000	0.0549	0.4077	0.0000
Brain	0.0008	0.0036	0.0133	0.0001	0.0007	0.0091	0.2273	0.0001
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.1343	0.2140	0.0000	0.0000	0.0596	0.3786	0.0000
Pancreas	0.0000	0.0777	0.1288	0.0000	0.0000	0.0444	0.2964	0.0000
Adrenals	0.0000	0.0453	0.0086	0.0000	0.0000	0.0319	0.1712	0.0000
Thyroid	0.0696	−0.1451	0.6784	0.0011	0.0138	−0.0471	0.2381	0.0016
Thymus	0.0000	0.0901	0.1450	0.0001	0.0000	0.0581	0.5069	0.0001
Larynx	0.0293	−0.0576	0.5224	0.0014	0.0162	−0.0211	0.2617	0.0017
Eyes	0.0004	0.0278	0.3097	0.0001	0.0005	0.0201	0.6226	0.0001
Small intestine	0.0000	0.0701	0.0911	0.0000	0.0000	0.0489	0.2889	0.0000
Esophagus	0.0024	−0.0945	0.5541	0.0001	0.0005	−0.0098	0.0258	0.0001
Marrow	0.0006	0.0016	0.0084	0.0000	0.0005	0.0049	0.1463	0.0000
Skin	0.0007	0.0162	0.2775	0.0001	0.0007	0.0081	0.2825	0.0001
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 30 Cervical spine LAT radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	2.76×10^{-5}	-0.04411	0.015398	6.59×10^{-6}	2.38×10^{-5}	-0.027	0.080171	6.37×10^{-6}
Body	0.000162	-0.01243	0.110112	1.08×10^{-5}	0.00018	-0.01319	0.464117	8.35×10^{-6}
Bones	0.00042	-0.00085	0.003264	3.99×10^{-5}	0.000379	0.003034	-0.00019	4×10^{-5}
Heart	2.17×10^{-6}	0.080781	0.158577	5.11×10^{-6}	2.81×10^{-6}	0.050412	0.443544	4.16×10^{-6}
Kidney	1.46×10^{-7}	0.089095	-0.16753	5.17×10^{-7}	7.32×10^{-7}	0.010009	0.027042	4.72×10^{-7}
Lung	1.85×10^{-5}	0.033176	0.070354	1.11×10^{-5}	1.39×10^{-5}	0.034654	0.368834	9.17×10^{-6}
Liver	4.94×10^{-7}	0.108924	0.220874	2.26×10^{-6}	1.17×10^{-6}	0.050225	0.368819	2.03×10^{-6}
Spleen	3.44×10^{-8}	0.177885	0.267547	9.14×10^{-7}	3.28×10^{-7}	0.05252	0.15224	9.84×10^{-7}
Gall bladder	9.56×10^{-7}	0.039509	0.044081	1.11×10^{-6}	6.83×10^{-7}	0.041105	0.249316	9.82×10^{-7}
Stomach	4.04×10^{-7}	0.081365	0.207376	1.01×10^{-6}	5.04×10^{-7}	0.051865	0.407907	8.72×10^{-7}
Brain	0.00019	-0.00392	0.012565	1.64×10^{-5}	0.000152	0.005158	0.040825	1.62×10^{-5}
Bladder	0	0		0	0	0		0
Large intestine	1.1×10^{-10}	0.366456	0.154879	4.35×10^{-7}	6.86×10^{-12}	0.311573	-0.11909	5.01×10^{-7}
Pancreas	1.7×10^{-7}	0.104856	0.142201	8.66×10^{-7}	2.95×10^{-7}	0.057651	0.286648	7.9×10^{-7}
Adrenals	1.39×10^{-6}	0.029502	0.003755	1.26×10^{-6}	1.41×10^{-6}	0.021418	0.090887	1.21×10^{-6}
Thyroid	0.015191	-0.15041	0.664494	0.000227	0.003536	-0.05712	0.318373	0.000324
Thymus	5.42×10^{-6}	0.093875	0.170432	1.69×10^{-5}	8.41×10^{-6}	0.053739	0.471147	1.35×10^{-5}
Larynx	0.0072	-0.06704	0.603769	0.000275	0.00416	-0.0296	0.428148	0.00033
Eyes	1×10^{-4}	0.025729	0.377242	1.45×10^{-5}	0.00011	0.015619	0.664885	1.07×10^{-5}
Small intestine	9.3×10^{-11}	0.369829	0.091707	4.81×10^{-7}	6.52×10^{-12}	0.319399	0.125705	4.72×10^{-7}
Esophagus	0.000448	-0.0928	0.59966	1.32×10^{-5}	8.08×10^{-5}	-0.00525	0.040654	2.04×10^{-5}
Marrow	0.000136	-0.0047	0.037184	6.62×10^{-6}	0.000122	0.000293	-0.00155	6.75×10^{-6}
Skin	0.000161	0.009162	0.132597	9.87×10^{-6}	0.000179	0.002932	0.094476	1.01×10^{-5}
Ovaries	0	0		0	0	0		0
Uterus	0	0		0	0	0		0
Vagina	0	0		0	0	0		0
Prostate	0	0		0	0	0		0
Testes	0	0		0	0	0		0

Table 31 Skull Lat radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0042	-0.2984	0.1682	0.0000	0.0001	-0.0218	0.0736	0.0000
Body	0.0005	0.0172	0.0312	0.0001	0.0007	-0.0052	0.0994	0.0001
Bones	0.0062	-0.0289	0.0814	0.0003	0.0037	0.0032	0.0355	0.0004
Heart	0.0000	0.2671	0.0539	0.0000	0.0000	0.0558	0.4525	0.0000
Kidney	0.0000	0.1003	-0.0447	0.0000	0.0000	0.0216	0.1027	0.0000
Lung	0.0000	0.1781	0.0589	0.0000	0.0000	0.0441	0.4764	0.0000
Liver	0.0000	0.2537	0.1061	0.0000	0.0000	0.0485	0.3883	0.0000
Spleen	0.0000	0.4177	0.1457	0.0000	0.0000	0.0616	0.1877	0.0000
Gall bladder	0.0000	0.1561	-0.0096	0.0000	0.0000	0.0531	0.3142	0.0000
Stomach	0.0000	0.2748	0.1017	0.0000	0.0000	0.0588	0.4642	0.0000
Brain	0.0068	0.0086	0.0124	0.0005	0.0067	0.0053	0.1762	0.0005
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.3573	0.1450	0.0000	0.0000	0.0616	0.4721	0.0000
Pancreas	0.0000	0.2647	0.0133	0.0000	0.0000	0.0515	0.3458	0.0000
Adrenals	0.0000	0.1819	-0.0302	0.0000	0.0000	0.0402	0.2322	0.0000
Thyroid	0.0084	-0.0876	0.2272	0.0003	0.0032	-0.0121	0.1701	0.0003
Thymus	0.0000	0.3276	0.1044	0.0001	0.0000	0.0621	0.4878	0.0000
Larynx	0.0223	-0.0591	0.1857	0.0010	0.0139	-0.0145	0.3985	0.0009
Eyes	0.0116	-0.0035	0.0019	0.0008	0.0099	0.0041	0.0952	0.0007
Small intestine	0.0000	0.3465	-0.1109	0.0000	0.0000	0.0586	0.3238	0.0000
Esophagus	0.0001	0.0409	-0.0266	0.0000	0.0001	0.0165	0.1859	0.0000
Marrow	0.0009	0.0085	0.0173	0.0001	0.0010	0.0036	0.0968	0.0001
Skin	0.0010	0.0236	0.1104	0.0001	0.0012	0.0047	0.1443	0.0001
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 32 Skull PA radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0046	−0.3186	0.4341	0.0000	0.0000	−0.0347	0.1138	0.0000
Body	0.0001	0.0989	0.1326	0.0000	0.0005	−0.0086	0.0485	0.0000
Bones	0.0050	−0.0452	0.2969	0.0002	0.0025	−0.0052	0.0852	0.0002
Heart	0.0008	−0.1889	−0.2017	0.0000	0.0000	0.0624	0.4951	0.0000
Kidney	0.0008	−0.3177	−0.2818	0.0000	0.0000	0.0373	0.1838	0.0000
Lung	0.0007	−0.1221	−0.1885	0.0000	0.0000	0.0491	0.5234	0.0000
Liver	0.0000	−0.0812	−0.0850	0.0000	0.0000	0.0542	0.4216	0.0000
Spleen	0.0000	0.1022	0.0610	0.0000	0.0000	0.0394	0.1500	0.0000
Gall bladder	0.0003	−0.1917	−0.1229	0.0000	0.0000	0.0556	0.3867	0.0000
Stomach	0.0000	−0.0705	−0.0677	0.0000	0.0000	0.0633	0.4642	0.0000
Brain	0.0064	−0.0137	0.0978	0.0002	0.0056	−0.0047	0.2444	0.0002
Bladder	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Large intestine	0.0000	0.2981	0.0412	0.0000	0.0000	0.0860	0.5085	0.0000
Pancreas	0.0001	−0.1558	−0.1204	0.0000	0.0000	0.0589	0.3615	0.0000
Adrenals	0.0003	−0.2091	−0.1947	0.0000	0.0000	0.0372	0.2482	0.0000
Thyroid	0.0012	−0.0153	0.0241	0.0001	0.0007	0.0101	0.2733	0.0001
Thymus	0.0014	−0.1689	−0.1953	0.0000	0.0000	0.0630	0.5035	0.0000
Larynx	0.0078	−0.0719	0.6393	0.0001	0.0021	−0.0012	0.0042	0.0002
Eyes	0.0007	−0.0149	0.1528	0.0000	0.0005	0.0003	−0.0024	0.0000
Small intestine	0.0001	−0.2558	−0.2224	0.0000	0.0000	0.1285	0.2818	0.0000
Esophagus	0.0006	−0.0815	−0.2143	0.0000	0.0001	0.0247	0.4394	0.0000
Marrow	0.0006	0.0016	−0.0130	0.0000	0.0007	−0.0035	0.1616	0.0000
Skin	0.0007	0.0100	−0.0153	0.0001	0.0008	−0.0009	0.0057	0.0001
Ovaries	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Uterus	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vagina	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Prostate	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 33 Hip AP radiography with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0030	−0.3399	−0.0256	0.0000	0.0000	−0.0486	−0.0048	0.0000
Body	0.0015	−0.0152	0.1685	0.0001	0.0012	−0.0045	0.0491	0.0001
Bones	0.0039	−0.0600	0.7756	0.0001	0.0022	−0.0299	0.6062	0.0001
Heart	0.0001	−0.0939	−0.0379	0.0000	0.0000	−0.0006	0.0012	0.0000
Kidney	0.0002	−0.0316	−0.0729	0.0000	0.0001	0.0168	−0.0300	0.0000
Lung	0.0000	−0.0690	0.0002	0.0000	0.0000	0.0004	−0.0007	0.0000
Liver	0.0002	−0.1100	0.0520	0.0000	0.0000	−0.0139	0.0414	0.0000
Spleen	0.0018	−0.1557	0.1383	0.0000	0.0001	−0.0344	0.0985	0.0000
Gall bladder	0.0007	−0.1242	0.0439	0.0000	0.0001	−0.0119	0.0624	0.0000
Stomach	0.0015	−0.1437	0.0359	0.0000	0.0001	−0.0135	0.0397	0.0000
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.0074	−0.0495	0.2846	0.0005	0.0048	−0.0258	0.2618	0.0005
Large intestine	0.0107	−0.0775	0.4328	0.0004	0.0063	−0.0461	0.5108	0.0004
Pancreas	0.0014	−0.1193	0.1079	0.0001	0.0002	−0.0173	0.0684	0.0001
Adrenals	0.0001	−0.0311	−0.0474	0.0000	0.0000	0.0144	0.0002	0.0000
Thyroid	104.882.1	−1.51547	−0.22395	4.38×10^{-7}	2.15×10^{-10}	0.206828	−0.00985	3.98×10^{-7}
Thymus	0.0000	−0.0660	−0.0236	0.0000	0.0000	−0.0015	0.0008	0.0000
Larynx	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Eyes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Small intestine	0.0224	−0.1245	0.3965	0.0005	0.0081	−0.0678	0.4072	0.0005
Esophagus	0.0000	−0.0576	−0.0244	0.0000	0.0000	0.0072	−0.0102	0.0000
Marrow	0.0015	−0.0538	0.7861	0.0000	0.0009	−0.0269	0.6338	0.0000
Skin	0.0010	−0.0012	−0.0022	0.0001	0.0009	0.0052	0.0519	0.0001
Ovaries	0.0176	−0.0913	0.6915	0.0004	0.0079	−0.0454	0.6891	0.0004
Uterus	0.0078	−0.0723	0.6154	0.0003	0.0039	−0.0334	0.5410	0.0003
Vagina	0.0048	−0.0423	0.3716	0.0003	0.0031	−0.0180	0.2797	0.0003
Prostate	0.0017	−0.0117	0.0377	0.0002	0.0014	−0.0036	0.0161	0.0002
Testes	0.0031	0.0139	0.0372	0.0008	0.0033	0.0094	0.0534	0.0008

Table 34 Hip AP radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0031	-0.3391	-0.0281	0.0000	0.0000	-0.0315	0.0047	0.0000
Body	0.0017	-0.0196	0.2638	0.0001	0.0013	-0.0070	0.1098	0.0001
Bones	0.0046	-0.0666	0.8059	0.0001	0.0025	-0.0342	0.6503	0.0001
Heart	0.0001	-0.1081	0.0046	0.0000	0.0000	-0.0096	0.0256	0.0000
Kidney	0.0003	-0.0416	-0.0583	0.0000	0.0001	0.0102	-0.0326	0.0000
Lung	0.0000	-0.0861	0.0582	0.0000	0.0000	-0.0112	0.0307	0.0000
Liver	0.0004	-0.1241	0.1070	0.0000	0.0000	-0.0224	0.0787	0.0000
Spleen	0.0025	-0.1688	0.1734	0.0000	0.0002	-0.0418	0.1277	0.0000
Gall bladder	0.0010	-0.1366	0.1116	0.0000	0.0001	-0.0197	0.1134	0.0000
Stomach	0.0020	-0.1555	0.0753	0.0000	0.0001	-0.0210	0.0692	0.0000
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.0090	-0.0572	0.3499	0.0005	0.0055	-0.0299	0.3225	0.0005
Large intestine	0.0122	-0.0824	0.4577	0.0005	0.0069	-0.0489	0.5354	0.0004
Pancreas	0.0019	-0.1300	0.1525	0.0001	0.0002	-0.0240	0.1021	0.0001
Adrenals	0.0001	-0.0418	-0.0394	0.0000	0.0000	0.0074	-0.0063	0.0000
Thyroid	130,843.5	-1.5285	-0.2528	4.59×10^{-7}	0.0000	0.2068	-0.0413	4.19×10^{-7}
Thymus	0.0000	-0.0925	0.0366	0.0000	0.0000	-0.0140	0.0265	0.0000
Larynx	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Eyes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Small intestine	0.0257	-0.1298	0.4163	0.0005	0.0089	-0.0708	0.4277	0.0005
Esophagus	0.0000	-0.0679	0.0079	0.0000	0.0000	0.0004	-0.0008	0.0000
Marrow	0.0020	-0.0628	0.8350	0.0000	0.0011	-0.0323	0.7001	0.0001
Skin	0.0010	-0.0025	-0.0018	0.0001	0.0009	0.0044	0.0370	0.0001
Ovaries	0.0211	-0.0985	0.7219	0.0004	0.0088	-0.0488	0.7164	0.0004
Uterus	0.0098	-0.0809	0.6667	0.0003	0.0045	-0.0374	0.5890	0.0003
Vagina	0.0059	-0.0500	0.4641	0.0003	0.0035	-0.0215	0.3606	0.0004
Prostate	0.0023	-0.0230	0.1382	0.0002	0.0018	-0.0100	0.0928	0.0002
Testes	0.0035	0.0092	0.0159	0.0009	0.0036	0.0068	0.0281	0.0008

Table 35 Knee AP radiography with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0	0		0	0	0		0
Body	0.001307	-0.02141	0.109549	0.000105	0.001126	-0.0066	0.085137	0.000106
Bones	0.00313	-0.03133	0.347173	0.000154	0.002538	-0.00997	0.271646	0.000163
Heart	0	0		0	0	0		0
Kidney	0	0		0	0	0		0
Lung	0	0		0	0	0		0
Liver	0	0		0	0	0		0
Spleen	0	0		0	0	0		0
Gall bladder	0	0		0	0	0		0
Stomach	0	0		0	0	0		0
Brain	0	0		0	0	0		0
Bladder	2.23×10^{-5}	-0.12042	-0.07951	3×10^{-6}	6.39×10^{-7}	0.060877	0.058095	2.8×10^{-6}
Large intestine	0.0002	-0.40763	-0.17951	6.83×10^{-7}	1.19×10^{-8}	0.125994	-0.13378	6.7×10^{-7}
Pancreas	0	0		0	0	0		0
Adrenals	0	0		0	0	0		0
Thyroid	0	0		0	0	0		0
Thymus	0	0		0	0	0		0
Larynx	0	0		0	0	0		0
Eyes	0	0		0	0	0		0
Small intestine	5.3×10^{-10}	0.300323	-0.00414	2.67×10^{-7}	7.41×10^{-8}	0	-1.1×10^{-15}	2.67×10^{-7}
Esophagus	0	0		0	0	0		0
Marrow	5.9×10^{-5}	-0.03901	0.057838	3.54×10^{-6}	3.17×10^{-5}	0.000809	-0.012	3.67×10^{-6}
Skin	0.002239	-0.02546	0.199455	0.000139	0.001784	-0.00603	0.09334	0.000148
Ovaries	3.69×10^{-7}	0.122956	0.122283	1.58×10^{-6}	1.6×10^{-7}	0.089132	0.045092	1.65×10^{-6}
Uterus	3.53×10^{-7}	0.150978	0.269901	1.55×10^{-6}	3.89×10^{-7}	0.074402	0.185749	1.63×10^{-6}
Vagina	6.08×10^{-6}	0.084666	0.152924	9.08×10^{-6}	4.63×10^{-6}	0.05346	0.114985	9.28×10^{-6}
Prostate	5.22×10^{-6}	0.001496	-0.00125	2.19×10^{-6}	5.07×10^{-6}	0.0019	0.00419	2.18×10^{-6}
Testes	6.4×10^{-5}	0.052616	0.05245	4.67×10^{-5}	7.43×10^{-5}	0.02473	0.218342	4.25×10^{-5}

Table 36 Knee PA radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0	0		0	0	0		0
Body	0.00165	−0.02915	0.202774	0.000112	0.00136	−0.00934	0.188626	0.000113
Bones	0.002971	−0.06495	0.558375	0.000116	0.00192	−0.02059	0.437445	0.000131
Heart	0	0		0	0	0		0
Kidney	0	0		0	0	0		0
Lung	0	0		0	0	0		0
Liver	0	0		0	0	0		0
Spleen	0	0		0	0	0		0
Gall bladder	0	0		0	0	0		0
Stomach	0	0		0	0	0		0
Brain	0	0		0	0	0		0
Bladder	2.99×10^{-5}	−0.14633	−0.07888	2.83×10^{-6}	7.06×10^{-7}	0.054643	0.042386	2.67×10^{-6}
Large intestine	0.003003	−0.61762	−0.28066	7.78×10^{-7}	5.27×10^{-7}	0.006493	0.003681	6.86×10^{-7}
Pancreas	0	0		0	0	0		0
Adrenals	0	0		0	0	0		0
Thyroid	0	0		0	0	0		0
Thymus	0	0		0	0	0		0
Larynx	0	0		0	0	0		0
Eyes	0	0		0	0	0		0
Small intestine	0	0		0	0	0		0
Esophagus	0	0		0	0	0		0
Marrow	5.63×10^{-5}	−0.05269	0.376832	2.73×10^{-6}	2.87×10^{-5}	−0.00493	0.10741	3.26×10^{-6}
Skin	0.002116	−0.02429	0.177701	0.000137	0.00168	−0.00525	0.069742	0.000146
Ovaries	2.57×10^{-7}	0.141763	0.130016	1.18×10^{-6}	2.42×10^{-7}	0.07419	−0.04404	1.29×10^{-6}
Uterus	6.11×10^{-7}	0.120135	0.194309	1.63×10^{-6}	6.31×10^{-7}	0.061911	0.316654	1.5×10^{-6}
Vagina	7.24×10^{-6}	0.070092	0.120398	8.29×10^{-6}	5.01×10^{-6}	0.04944	0.122937	8.28×10^{-6}
Prostate	5.55×10^{-6}	−0.00429	0.006052	2.19×10^{-6}	6.32×10^{-6}	−0.00718	−0.01085	2.21×10^{-6}
Testes	9.35×10^{-5}	−0.02615	0.016857	1.78×10^{-5}	6.76×10^{-5}	−0.00317	−0.01011	1.8×10^{-5}

Table 37 Lumbar spine AP radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0002	−0.0554	0.0982	0.0000	0.0001	−0.0313	0.1350	0.0000
Body	0.0007	−0.0076	0.0629	0.0001	0.0007	−0.0045	0.0702	0.0001
Bones	0.0040	−0.0923	0.8984	0.0001	0.0022	−0.0624	0.6484	0.0001
Heart	0.0031	−0.0854	0.2033	0.0002	0.0034	−0.0828	0.3185	0.0002
Kidney	0.0124	−0.0873	0.7797	0.0003	0.0069	−0.0581	0.6052	0.0003
Lung	0.0009	−0.0705	0.2624	0.0001	0.0008	−0.0625	0.4078	0.0001
Liver	0.0258	−0.1076	0.3501	0.0011	0.0342	−0.1121	0.5120	0.0009
Spleen	0.0505	−0.1047	0.3411	0.0022	0.0468	−0.0947	0.4098	0.0021
Gall bladder	0.0056	−0.0950	0.4571	0.0002	0.0053	−0.0870	0.5766	0.0002
Stomach	0.0261	−0.0761	0.2619	0.0020	0.0315	−0.0777	0.4446	0.0018
Brain	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Bladder	0.0006	−0.0200	0.0273	0.0002	0.0006	−0.0153	0.0318	0.0002
Large intestine	0.0246	−0.0748	0.7267	0.0007	0.0177	−0.0565	0.7161	0.0007
Pancreas	0.0290	−0.0755	0.5368	0.0012	0.0237	−0.0621	0.6144	0.0011
Adrenals	0.0070	−0.0701	0.5594	0.0003	0.0043	−0.0464	0.4484	0.0003
Thyroid	0.0000	0.0028	−0.0001	0.0000	0.0000	0.0086	0.0114	0.0000
Thymus	0.0003	−0.0609	0.1474	0.0000	0.0003	−0.0521	0.2623	0.0000
Larynx	0.0000	0.0089	0.0104	0.0000	0.0000	0.0116	0.0206	0.0000
Eyes	0.0000	0.1619	−0.0219	0.0000	0.0055	−0.4971	−0.2499	0.0000
Small intestine	0.0287	−0.0564	0.6075	0.0012	0.0240	−0.0454	0.6957	0.0011
Esophagus	0.0032	−0.0944	0.2461	0.0002	0.0032	−0.0878	0.3373	0.0002
Marrow	0.0025	−0.0906	0.8897	0.0000	0.0013	−0.0569	0.6140	0.0001
Skin	0.0006	−0.0121	0.3026	0.0000	0.0006	−0.0080	0.3451	0.0000
Ovaries	0.0014	−0.0360	0.1640	0.0002	0.0010	−0.0202	0.1088	0.0002
Uterus	0.0016	−0.0493	0.2569	0.0002	0.0009	−0.0230	0.1319	0.0002
Vagina	0.0001	−0.0006	0.0033	0.0000	0.0001	−0.0059	0.0175	0.0000
Prostate	0.0009	−0.0710	0.3411	0.0000	0.0005	−0.0458	0.2198	0.0000
Testes	0.0000	−0.0137	0.0282	0.0000	0.0000	−0.0125	0.0326	0.0000

Table 38 Lumbar spine LAT radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0004	−0.0891	0.1015	0.0000	0.0000	−0.0280	0.0856	0.0000
Body	0.0010	−0.0093	0.1260	0.0001	0.0009	−0.0082	0.1912	0.0001
Bones	0.0057	−0.0547	0.7020	0.0001	0.0025	−0.0385	0.6562	0.0001
Heart	0.0024	−0.0886	0.3316	0.0001	0.0006	−0.0584	0.4058	0.0001
Kidney	0.0450	−0.0705	0.6218	0.0009	0.0177	−0.0543	0.6479	0.0008
Lung	0.0029	−0.0790	0.1795	0.0001	0.0009	−0.0556	0.2155	0.0001
Liver	0.0442	−0.0775	0.4347	0.0011	0.0201	−0.0690	0.5315	0.0010
Spleen	0.1218	−0.1302	0.3479	0.0011	0.0422	−0.1282	0.4080	0.0010
Gall bladder	0.0050	−0.0972	0.5775	0.0001	0.0010	−0.0601	0.5505	0.0001
Stomach	0.0058	−0.0932	0.5368	0.0001	0.0012	−0.0586	0.5046	0.0001
Brain	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Bladder	0.0003	−0.0229	0.0880	0.0000	0.0002	−0.0199	0.0230	0.0000
Large intestine	0.0083	−0.0705	0.2506	0.0004	0.0025	−0.0447	0.1863	0.0004
Pancreas	0.0138	−0.0844	0.5074	0.0003	0.0040	−0.0607	0.4467	0.0003
Adrenals	0.0215	−0.0703	0.4352	0.0006	0.0094	−0.0581	0.5108	0.0006
Thyroid	0.0000	−0.0006	0.0000	0.0000	0.0000	0.0177	0.0104	0.0000
Thymus	0.0005	−0.0677	0.2054	0.0000	0.0002	−0.0432	0.2534	0.0000
Larynx	0.0000	0.0057	0.0050	0.0000	0.0000	0.0219	0.0348	0.0000
Eyes	1.11×10^{18}	−2.33801	−0.1739	3.92×10^{-7}	1.61×10^{11}	−2.18335	−0.04415	3.7×10^{-7}
Small intestine	0.0080	−0.0797	0.4637	0.0002	0.0021	−0.0503	0.3230	0.0002
Esophagus	0.0023	−0.0754	0.2772	0.0001	0.0008	−0.0558	0.3432	0.0001
Marrow	0.0035	−0.0551	0.8025	0.0001	0.0015	−0.0373	0.6978	0.0001
Skin	0.0019	−0.0319	0.5423	0.0001	0.0013	−0.0262	0.6918	0.0001
Ovaries	0.0004	−0.0113	0.0274	0.0001	0.0002	0.0060	−0.0081	0.0001
Uterus	0.0004	−0.0144	0.0554	0.0001	0.0002	0.0036	−0.0087	0.0001
Vagina	0.0001	0.0087	−0.0045	0.0000	0.0000	0.0185	0.0567	0.0000
Prostate	0.0002	−0.0320	0.1360	0.0000	0.0002	−0.0324	0.1130	0.0000
Testes	0.0000	−0.0192	0.0632	0.0000	0.0000	−0.0182	0.0139	0.0000

Table 39 Thoracic spine AP radiography with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.4081	−0.2205	0.3164	0.0020	0.0309	−0.0971	0.1849	0.0022
Body	0.0012	−0.0231	0.2145	0.0001	0.0009	−0.0102	0.1834	0.0001
Bones	0.0044	−0.0479	0.5408	0.0002	0.0029	−0.0266	0.6060	0.0002
Heart	0.0195	−0.0447	0.4906	0.0008	0.0133	−0.0250	0.5617	0.0008
Kidney	0.0077	−0.1106	0.2617	0.0003	0.0014	−0.0332	0.0873	0.0003
Lung	0.0151	−0.0580	0.7146	0.0004	0.0087	−0.0304	0.7080	0.0004
Liver	0.0095	−0.0484	0.2185	0.0007	0.0053	−0.0205	0.1450	0.0008
Spleen	0.0066	−0.0585	0.0313	0.0014	0.0022	−0.0107	0.0040	0.0015
Gall bladder	0.0095	−0.1118	0.5260	0.0002	0.0022	−0.0440	0.3023	0.0002
Stomach	0.0057	−0.0086	0.0057	0.0014	0.0052	−0.0044	0.0058	0.0014
Brain	0.0000	0.0021	−0.0032	0.0000	0.0000	0.0072	−0.0074	0.0000
Bladder	0.0000	0.0270	0.0250	0.0000	0.0000	0.0102	0.0211	0.0000
Large intestine	0.0002	0.0601	0.0704	0.0005	0.0002	0.0403	0.1106	0.0005
Pancreas	0.0047	−0.0267	0.0330	0.0010	0.0028	−0.0044	0.0034	0.0010
Adrenals	0.0098	−0.0874	0.4432	0.0003	0.0030	−0.0329	0.2402	0.0004
Thyroid	0.0951	−0.0929	0.6634	0.0019	0.0369	−0.0465	0.6035	0.0021
Thymus	0.0186	−0.0357	0.4138	0.0009	0.0138	−0.0202	0.4912	0.0009
Larynx	0.0260	−0.0782	0.3087	0.0013	0.0099	−0.0327	0.1922	0.0014
Eyes	0.0000	0.0504	0.2809	0.0000	0.0000	0.0298	0.3583	0.0000
Small intestine	0.0004	0.0305	0.0230	0.0004	0.0003	0.0293	0.0825	0.0004
Esophagus	0.0249	−0.0840	0.8273	0.0004	0.0099	−0.0394	0.6688	0.0005
Marrow	0.0027	−0.0500	0.7613	0.0001	0.0016	−0.0255	0.6773	0.0001
Skin	0.0012	−0.0243	0.3923	0.0001	0.0010	−0.0135	0.3778	0.0001
Ovaries	0.0000	0.0210	0.0709	0.0000	0.0000	0.0314	0.1052	0.0000
Uterus	0.0000	0.0262	0.0899	0.0000	0.0000	0.0280	0.1192	0.0000
Vagina	0.0000	0.0276	0.1224	0.0000	0.0000	0.0366	0.1704	0.0000
Prostate	0.0000	0.0040	−0.0055	0.0000	0.0000	−0.0123	0.0305	0.0000
Testes	6.07×10^{-43}	2.3844	−0.1759	1.25×10^{-6}	1.48×10^{15}	−2.401	−0.050	1.18×10^{-6}

Table 40 Thoracic spine AP radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.4081	−0.2205	0.3164	0.0020	0.0309	−0.0971	0.1849	0.0022
Body	0.0012	−0.0231	0.2145	0.0001	0.0009	−0.0102	0.1834	0.0001
Bones	0.0044	−0.0479	0.5408	0.0002	0.0029	−0.0266	0.6060	0.0002
Heart	0.0195	−0.0447	0.4906	0.0008	0.0133	−0.0250	0.5617	0.0008
Kidney	0.0077	−0.1106	0.2617	0.0003	0.0014	−0.0332	0.0873	0.0003
Lung	0.0151	−0.0580	0.7146	0.0004	0.0087	−0.0304	0.7080	0.0004
Liver	0.0095	−0.0484	0.2185	0.0007	0.0053	−0.0205	0.1450	0.0008
Spleen	0.0066	−0.0585	0.0313	0.0014	0.0022	−0.0107	0.0040	0.0015
Gall bladder	0.0095	−0.1118	0.5260	0.0002	0.0022	−0.0440	0.3023	0.0002
Stomach	0.0057	−0.0086	0.0057	0.0014	0.0052	−0.0044	0.0058	0.0014
Brain	0.0000	0.0021	−0.0032	0.0000	0.0000	0.0072	−0.0074	0.0000
Bladder	0.0000	0.0270	0.0250	0.0000	0.0000	0.0102	0.0211	0.0000
Large intestine	0.0002	0.0601	0.0704	0.0005	0.0002	0.0403	0.1106	0.0005
Pancreas	0.0047	−0.0267	0.0330	0.0010	0.0028	−0.0044	0.0034	0.0010
Adrenals	0.0098	−0.0874	0.4432	0.0003	0.0030	−0.0329	0.2402	0.0004
Thyroid	0.0951	−0.0929	0.6634	0.0019	0.0369	−0.0465	0.6035	0.0021
Thymus	0.0186	−0.0357	0.4138	0.0009	0.0138	−0.0202	0.4912	0.0009
Larynx	0.0260	−0.0782	0.3087	0.0013	0.0099	−0.0327	0.1922	0.0014
Eyes	0.0000	0.0504	0.2809	0.0000	0.0000	0.0298	0.3583	0.0000
Small intestine	0.0004	0.0305	0.0230	0.0004	0.0003	0.0293	0.0825	0.0004
Esophagus	0.0249	−0.0840	0.8273	0.0004	0.0099	−0.0394	0.6688	0.0005
Marrow	0.0027	−0.0500	0.7613	0.0001	0.0016	−0.0255	0.6773	0.0001
Skin	0.0012	−0.0243	0.3923	0.0001	0.0010	−0.0135	0.3778	0.0001
Ovaries	0.0000	0.0210	0.0709	0.0000	0.0000	0.0314	0.1052	0.0000
Uterus	0.0000	0.0262	0.0899	0.0000	0.0000	0.0280	0.1192	0.0000
Vagina	0.0000	0.0276	0.1224	0.0000	0.0000	0.0366	0.1704	0.0000
Prostate	0.0000	0.0040	−0.0055	0.0000	0.0000	−0.0123	0.0305	0.0000
Testes	6.07×10^{-43}	2.3844	−0.1759	1.25×10^{-6}	1.48×10^{15}	−2.4010	−0.0504	1.18×10^{-6}

Table 41 Thoracic spine LAT radiography with table.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE	<i>a</i>	<i>b</i>	<i>R</i> ²	RMSE
Breast	0.0081	−0.0949	0.1215	0.0001	0.0006	−0.0351	0.1524	0.0001
Body	0.0026	−0.0310	0.4340	0.0001	0.0012	−0.0149	0.3521	0.0001
Bones	0.0134	−0.0533	0.6493	0.0002	0.0036	−0.0256	0.5537	0.0002
Heart	0.0351	−0.0896	0.4283	0.0003	0.0050	−0.0529	0.5163	0.0003
Kidney	0.0025	−0.0395	0.0459	0.0003	0.0005	0.0010	0.0002	0.0003
Lung	0.0344	−0.0612	0.5064	0.0006	0.0083	−0.0327	0.5384	0.0005
Liver	0.0078	−0.0301	0.0343	0.0011	0.0034	−0.0114	0.0195	0.0011
Spleen	0.0018	−0.0367	0.0200	0.0003	0.0006	−0.0086	0.0050	0.0003
Gall bladder	0.0067	−0.0745	0.3122	0.0001	0.0009	−0.0307	0.2044	0.0001
Stomach	0.0037	−0.0580	0.1830	0.0001	0.0010	−0.0342	0.2335	0.0001
Brain	0.0001	−0.0640	0.1605	0.0000	0.0000	0.0024	−0.0051	0.0000
Bladder	0.0000	−0.0328	0.0182	0.0000	0.0000	0.0112	0.0087	0.0000
Large intestine	0.0001	−0.0030	0.0033	0.0001	0.0001	0.0024	0.0039	0.0001
Pancreas	0.0035	−0.0554	0.0925	0.0002	0.0009	−0.0252	0.0801	0.0002
Adrenals	0.0481	−0.0916	0.2912	0.0006	0.0049	−0.0431	0.2052	0.0006
Thyroid	0.0002	0.0142	−0.0210	0.0001	0.0002	0.0231	0.1876	0.0001
Thymus	0.0090	−0.0596	0.4128	0.0002	0.0023	−0.0324	0.4389	0.0002
Larynx	0.0001	0.0117	−0.0184	0.0000	0.0001	0.0233	0.1798	0.0000
Eyes	0.0000	−0.0394	0.1277	0.0000	0.0000	0.0096	−0.0347	0.0000
Small intestine	0.0007	−0.0483	0.0827	0.0000	0.0002	−0.0120	0.0077	0.0001
Esophagus	0.0380	−0.0709	0.4757	0.0005	0.0070	−0.0359	0.4542	0.0005
Marrow	0.0082	−0.0591	0.6397	0.0001	0.0020	−0.0301	0.6114	0.0001
Skin	0.0066	−0.0551	0.5410	0.0001	0.0015	−0.0225	0.3807	0.0001
Ovaries	0.0000	0.0360	0.0045	0.0000	0.0000	0.0320	0.0523	0.0000
Uterus	0.0000	0.0126	0.0063	0.0000	0.0000	0.0298	0.0713	0.0000
Vagina	0.0000	0.0278	0.0018	0.0000	0.0000	0.0307	0.0961	0.0000
Prostate	0.0001	−0.1112	−0.0348	0.0000	0.0000	−0.0236	0.0489	0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Table 42 Thoracic spine LAT radiography with wallstand.

Organ	Thickness				BMI			
	<i>a</i>	<i>b</i>	R^2	RMSE	<i>a</i>	<i>b</i>	R^2	RMSE
Breast	0.0081	-0.0949	0.1215	0.0001	0.0006	-0.0351	0.1524	0.0001
Body	0.0026	-0.0310	0.4340	0.0001	0.0012	-0.0149	0.3521	0.0001
Bones	0.0134	-0.0533	0.6493	0.0002	0.0036	-0.0256	0.5537	0.0002
Heart	0.0351	-0.0896	0.4283	0.0003	0.0050	-0.0529	0.5163	0.0003
Kidney	0.0025	-0.0395	0.0459	0.0003	0.0005	0.0010	0.0002	0.0003
Lung	0.0344	-0.0612	0.5064	0.0006	0.0083	-0.0327	0.5384	0.0005
Liver	0.0078	-0.0301	0.0343	0.0011	0.0034	-0.0114	0.0195	0.0011
Spleen	0.0018	-0.0367	0.0200	0.0003	0.0006	-0.0086	0.0050	0.0003
Gall bladder	0.0067	-0.0745	0.3122	0.0001	0.0009	-0.0307	0.2044	0.0001
Stomach	0.0037	-0.0580	0.1830	0.0001	0.0010	-0.0342	0.2335	0.0001
Brain	0.0001	-0.0640	0.1605	0.0000	0.0000	0.0024	-0.0051	0.0000
Bladder	0.0000	-0.0328	0.0182	0.0000	0.0000	0.0112	0.0087	0.0000
Large intestine	0.0001	-0.0030	0.0033	0.0001	0.0001	0.0024	0.0039	0.0001
Pancreas	0.0035	-0.0554	0.0925	0.0002	0.0009	-0.0252	0.0801	0.0002
Adrenals	0.0481	-0.0916	0.2912	0.0006	0.0049	-0.0431	0.2052	0.0006
Thyroid	0.0002	0.0142	-0.0210	0.0001	0.0002	0.0231	0.1876	0.0001
Thymus	0.0090	-0.0596	0.4128	0.0002	0.0023	-0.0324	0.4389	0.0002
Larynx	0.0001	0.0117	-0.0184	0.0000	0.0001	0.0233	0.1798	0.0000
Eyes	0.0000	-0.0394	0.1277	0.0000	0.0000	0.0096	-0.0347	0.0000
Small intestine	0.0007	-0.0483	0.0827	0.0000	0.0002	-0.0120	0.0077	0.0001
Esophagus	0.0380	-0.0709	0.4757	0.0005	0.0070	-0.0359	0.4542	0.0005
Marrow	0.0082	-0.0591	0.6397	0.0001	0.0020	-0.0301	0.6114	0.0001
Skin	0.0066	-0.0551	0.5410	0.0001	0.0015	-0.0225	0.3807	0.0001
Ovaries	0.0000	0.0360	0.0045	0.0000	0.0000	0.0320	0.0523	0.0000
Uterus	0.0000	0.0126	0.0063	0.0000	0.0000	0.0298	0.0713	0.0000
Vagina	0.0000	0.0278	0.0018	0.0000	0.0000	0.0307	0.0961	0.0000
Prostate	0.0001	-0.1112	-0.0348	0.0000	0.0000	-0.0236	0.0489	0.0000
Testes	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

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Biographies for the authors are not available.