

Appendix 1

Appendix 1A Dunnett's multiple comparison test of the mean HU of 80 kVp single energy CT (SECT) and the 80 kV virtual blended images (VBI) reconstructed from different dual energy CT (DECT) pairings (high kVp/low kVp)

Combination	Mean difference	95 % CI	Adjusted P value	P value summary
SECT 80 kVp vs. 80kVEquiv.\5+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\10+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\20+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\40+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\80+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\160+30 mAs	6.421	3.547 to 9.294	<0.0001	****
SECT 80 kVp vs. 80kVEquiv.\5+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\10+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\20+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\40+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\80+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\160+55 mAs	2.997	0.6264 to 5.367	0.0046	**
SECT 80 kVp vs. 80kVEquiv.\5+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\10+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\20+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\40+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\80+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\160+115 mAs	1.317	0.1874 to 2.446	0.0119	*
SECT 80 kVp vs. 80kVEquiv.\5+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\10+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\20+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\40+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\80+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\160+230 mAs	1.911	0.4549 to 3.368	0.0029	**
SECT 80 kVp vs. 80kVEquiv.\5+400 mAs	0.5092	-0.7523 to 1.771	0.9663	ns
SECT 80 kVp vs. 80kVEquiv.\10+400 mAs	0.5092	-0.7523 to 1.771	0.9663	ns
SECT 80 kVp vs. 80kVEquiv.\20+400 mAs	0.5092	-0.7523 to 1.771	0.9663	ns
SECT 80 kVp vs. 80kVEquiv.\40+400 mAs	0.5092	-0.7523 to 1.771	0.9663	ns
SECT 80 kVp vs. 80kVEquiv.\80+400 mAs	0.5092	-0.7523 to 1.771	0.9663	ns

ns, P>0.05; *, P=0.05–0.01; **, P=0.01–0.001; ****, P<0.0001.

Appendix 1B Dunnett's multiple comparison test of the mean HU of 100 kVp single energy CT (SECT) and the 100 kV virtual blended images (VBI) reconstructed from different dual energy CT (DECT) pairings (high kVp/low kVp)

Combination	Mean difference	95 % CI	Adjusted P value	P value summary
SECT 100 kVp vs. 100kVEquiv.\5+30 mAs	-29.21	-34.2 to -24.22	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\10+30 mAs	-29.52	-34.65 to -24.39	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\20+30 mAs	-29.99	-35.11 to -24.87	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\40+30 mAs	-29.94	-34.93 to -24.95	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\80+30 mAs	-29.96	-34.99 to -24.93	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\160+30 mAs	-29.19	-34.31 to -24.07	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\5+55 mAs	-31.06	-36.06 to -26.07	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\10+55 mAs	-31.37	-36.53 to -26.21	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\20+55 mAs	-31.84	-37.03 to -26.65	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\40+55 mAs	-31.79	-36.87 to -26.7	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\80+55 mAs	-31.81	-36.92 to -26.7	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\160+55 mAs	-31.05	-36.25 to -25.85	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\5+115 mAs	-31.95	-37.09 to -26.81	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\10+115 mAs	-32.27	-37.62 to -26.92	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\20+115 mAs	-32.74	-38.14 to -27.35	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\40+115 mAs	-32.69	-37.97 to -27.41	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\80+115 mAs	-32.71	-38 to -27.42	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\160+115 mAs	-31.95	-37.34 to -26.56	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\5+230 mAs	-31.64	-36.73 to -26.55	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\10+230 mAs	-31.95	-37.23 to -26.66	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\20+230 mAs	-32.42	-37.74 to -27.1	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\40+230 mAs	-32.37	-37.58 to -27.16	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\80+230 mAs	-32.39	-37.62 to -27.16	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\160+230 mAs	-31.63	-36.95 to -26.3	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\5+400 mAs	-32.39	-37.83 to -26.95	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\10+400 mAs	-32.7	-38.34 to -27.05	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\20+400 mAs	-33.18	-38.82 to -27.54	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\40+400 mAs	-33.12	-38.64 to -27.6	<0.0001	****
SECT 100 kVp vs. 100kVEquiv.\80+400 mAs	-33.14	-38.69 to -27.59	<0.0001	****

****, P<0.0001.

Appendix 1C Dunnett's multiple comparison test of the mean HU of 120 kVp single energy CT (SECT) and the 120 kV virtual blended images (VBI) reconstructed from different dual energy CT (DECT) pairings (high kVp/low kVp)

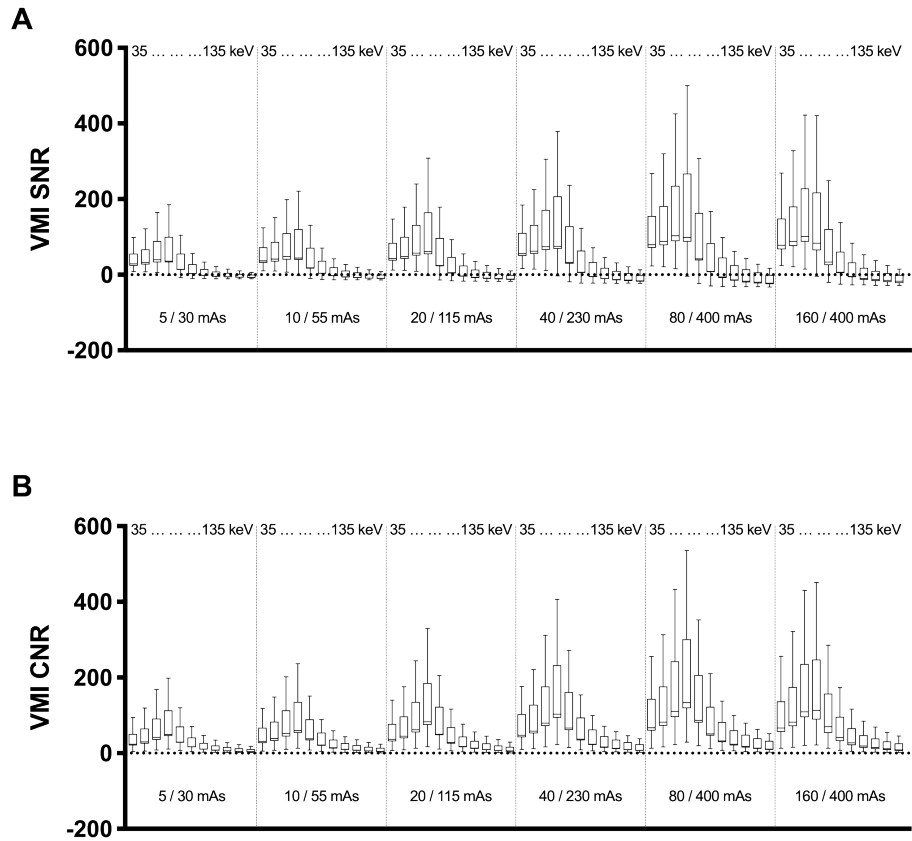
Combination	Mean difference	95 % CI	Adjusted P value	P value summary
SECT 120 kVp vs. 120kVEquiv.\5+30 mAs	-20.49	-24.09 to -16.9	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\10+30 mAs	-21.01	-24.58 to -17.43	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\20+30 mAs	-21.8	-25.07 to -18.53	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\40+30 mAs	-21.7	-24.86 to -18.54	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\80+30 mAs	-21.74	-25.03 to -18.44	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\160+30 mAs	-20.44	-23.78 to -17.1	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\5+55 mAs	-21.25	-24.74 to -17.77	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\10+55 mAs	-21.76	-25.26 to -18.26	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\20+55 mAs	-22.56	-25.8 to -19.32	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\40+55 mAs	-22.45	-25.6 to -19.31	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\80+55 mAs	-22.49	-25.75 to -19.23	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\160+55 mAs	-21.19	-24.49 to -17.88	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\5+115 mAs	-21.63	-25.03 to -18.22	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\10+115 mAs	-22.13	-25.59 to -18.66	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\20+115 mAs	-22.92	-26.14 to -19.7	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\40+115 mAs	-22.82	-25.93 to -19.71	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\80+115 mAs	-22.85	-26.07 to -19.63	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\160+115 mAs	-21.56	-24.83 to -18.28	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\5+230 mAs	-21.49	-24.94 to -18.03	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\10+230 mAs	-21.99	-25.49 to -18.5	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\20+230 mAs	-22.79	-26.03 to -19.56	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\40+230 mAs	-22.69	-25.82 to -19.55	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\80+230 mAs	-22.72	-25.98 to -19.47	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\160+230 mAs	-21.42	-24.72 to -18.12	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\5+400 mAs	-21.8	-25.39 to -18.2	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\10+400 mAs	-22.3	-25.96 to -18.65	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\20+400 mAs	-23.1	-26.46 to -19.73	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\40+400 mAs	-23	-26.26 to -19.75	<0.0001	****
SECT 120 kVp vs. 120kVEquiv.\80+400 mAs	-23.03	-26.42 to -19.65	<0.0001	****

****, P<0.0001.

Appendix 1D Dunnett's multiple comparison test of the mean HU of the 135 kVp single energy CT (SECT) and the 135 kV virtual blended images (VBI) reconstructed from different dual energy CT (DECT) pairings (high kVp/low kVp)

Combination	Mean difference	95 % CI	Adjusted P value	P value summary
SECT 135 kVp vs. 135kVEquiv.\5+30 mAs	1.68	-0.06479 to 3.425	0.0670	ns
SECT 135 kVp vs. 135kVEquiv.\10+30 mAs	1.035	-0.5016 to 2.572	0.4258	ns
SECT 135 kVp vs. 135kVEquiv.\20+30 mAs	0.01715	-1.313 to 1.347	>0.9999	ns
SECT 135 kVp vs. 135kVEquiv.\40+30 mAs	0.1403	-0.7776 to 1.058	0.9994	ns
SECT 135 kVp vs. 135kVEquiv.\80+30 mAs	0.09757	-0.977 to 1.172	0.9996	ns
SECT 135 kVp vs. 135kVEquiv.\160+30 mAs	1.761	0.7373 to 2.784	<0.0001	****
SECT 135 kVp vs. 135kVEquiv.\5+55 mAs	1.68	-0.06479 to 3.425	0.0670	ns
SECT 135 kVp vs. 135kVEquiv.\10+55 mAs	1.035	-0.5016 to 2.572	0.4258	ns
SECT 135 kVp vs. 135kVEquiv.\20+55 mAs	0.01715	-1.313 to 1.347	>0.9999	ns
SECT 135 kVp vs. 135kVEquiv.\40+55 mAs	0.1403	-0.7776 to 1.058	0.9994	ns
SECT 135 kVp vs. 135kVEquiv.\80+55 mAs	0.09757	-0.977 to 1.172	0.9996	ns
SECT 135 kVp vs. 135kVEquiv.\160+55 mAs	1.761	0.7373 to 2.784	<0.0001	****
SECT 135 kVp vs. 135kVEquiv.\5+115 mAs	1.68	-0.06479 to 3.425	0.0670	ns
SECT 135 kVp vs. 135kVEquiv.\10+115 mAs	1.035	-0.5016 to 2.572	0.4258	ns
SECT 135 kVp vs. 135kVEquiv.\20+115 mAs	0.01715	-1.313 to 1.347	>0.9999	ns
SECT 135 kVp vs. 135kVEquiv.\40+115 mAs	0.1403	-0.7776 to 1.058	0.9994	ns
SECT 135 kVp vs. 135kVEquiv.\80+115 mAs	0.09757	-0.977 to 1.172	0.9996	ns
SECT 135 kVp vs. 135kVEquiv.\160+115 mAs	1.761	0.7373 to 2.784	<0.0001	****
SECT 135 kVp vs. 135kVEquiv.\5+230 mAs	1.68	-0.06479 to 3.425	0.0670	ns
SECT 135 kVp vs. 135kVEquiv.\10+230 mAs	1.035	-0.5016 to 2.572	0.4258	ns
SECT 135 kVp vs. 135kVEquiv.\20+230 mAs	0.01715	-1.313 to 1.347	>0.9999	ns
SECT 135 kVp vs. 135kVEquiv.\40+230 mAs	0.1403	-0.7776 to 1.058	0.9994	ns
SECT 135 kVp vs. 135kVEquiv.\80+230 mAs	0.09757	-0.977 to 1.172	0.9996	ns
SECT 135 kVp vs. 135kVEquiv.\160+230 mAs	1.761	0.7373 to 2.784	<0.0001	****
SECT 135 kVp vs. 135kVEquiv.\5+400 mAs	1.68	-0.06479 to 3.425	0.0670	ns
SECT 135 kVp vs. 135kVEquiv.\10+400 mAs	1.035	-0.5016 to 2.572	0.4258	ns
SECT 135 kVp vs. 135kVEquiv.\20+400 mAs	0.01715	-1.313 to 1.347	>0.9999	ns
SECT 135 kVp vs. 135kVEquiv.\40+400 mAs	0.1403	-0.7776 to 1.058	0.9994	ns
SECT 135 kVp vs. 135kVEquiv.\80+400 mAs	0.09757	-0.977 to 1.172	0.9996	ns

ns, P>0.05; ****, P<0.0001.



Appendix 2 Signal to noise ratio (SNR; A) and contrast to noise ratio (CNR; B) of the virtual monochromatic images (VMI) reconstructed from dual energy computed tomography (DECT). A and B: For each radiation dose the SNR and CNR values are highest for 65 keV reconstructions.