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Supplementary Material

Size Specific Dose Estimate in Abdominal Computed Tomography by AAPM TG Report-204 and AAPM TG Report-220

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ABSTRACT

Purpose: The AAPM Task Group (TG) reports 204 and 220 presented methods for evaluation of patient dose by announcing the SSDE. The TG reports provide the Size Specific Conversion factors that can be multiplied to $CTDI_{vol}$ to calculate the patient dose in terms of SSDE constructed from D_{eff} (AAPM TG-204) and W_w (AAPM TG-220). Our study presents a comparison of the two TG reports on SSDE for the routine Abdominal Computed Tomography.

Materials and Methods: The scan lengths of abdomen were measured from computed tomography (CT) topographic images and cross-section at the mid-slice of the abdomen were measured from tomographic images of 61 adults who had undergone abdominal CT using the GE Advance Workstation (AWS) software. The D_{eff} and D_w was computed according to TG- 204 and TG-220 reports, respectively. Further, we performed the correlation analysis between D_{eff} and BMI, D_w and BMI and SSDE and BMI for both the TG-reports. The Student's paired *t-test* was performed to compare the two of SSDE calculation methods.

Results: The results confirm that the mean value of SSDE is 13.04 (mGy) and 13.60 (mGy) for AAPM TG-220 and AAPM TG-204, respectively. And a good positive correlation was observed between D_{eff} and BMI, D_w and BMI with $r = 0.67$ and $r = 0.68$ respectively. Also, the weak correlation was observed between SSDE and BMI for both the TG - reports. The Student's paired *t-test* shows that the two means of SSDE calculation methods are significantly different ($p < 0.01$) in abdominal computed tomography.

Conclusion: We confirm the AAPM TG reports 204/220 using clinical data for SSDE calculation that the mean SSDE values computed from D_{eff} and D_w in abdominal computed tomography are significantly different and we conclude that the SSDE calculated by D_w method gives a more accurate evaluation of SSDE for the patients undergoing abdominal computed tomography scan then the SSDE calculated by D_{eff} method.

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ROI mean	=A1/1000	=B1+1	=SQRT(C1)	Area of ROI (Sq.Cm)	=E1/3.14!	=SQRT(F1)	=2*D1*G1	=H1!	correction factor	CTDIVol	=J1*K1
-11	-0.011	0.989	0.994484791	572	182.1656051	13.4968739	26.84487165	27	1.37	9.88	13.54
29	0.029	1.029	1.014396372	673.52	214.4968153	14.64570979	29.71310976	30	1.23	9.6	11.81
-25	-0.025	0.975	0.987420883	710	226.1146497	15.03710909	29.69591106	30	1.23	8.32	10.23
29	0.029	1.029	1.014396372	558.7	177.9299363	13.33903806	27.06214363	27	1.37	7.11	9.74
31	0.031	1.031	1.015381702	465.97	148.3980892	12.18187544	24.73850682	25	1.48	6.89	10.20
18	0.018	1.018	1.00895986	399	127.0700637	11.27253581	22.74707233	23	1.59	7.08	11.26
-9	-0.009	0.991	0.995489829	620	197.4522293	14.05176961	27.97678747	28	1.32	10.8	14.26
-29	-0.029	0.971	0.985393322	544	173.2484076	13.16238609	25.94025473	26	1.43	10.77	15.40
-151	-0.151	0.849	0.92141196	388	123.566879	11.11606401	20.48494865	20	1.78	9.39	16.71
26.4	0.0264	1.0264	1.013114011	670.88	213.656051	14.61697817	29.61733078	30	1.23	10.3	12.67
52.7	0.0527	1.0527	1.026011696	626	199.3630573	14.11959834	28.97374608	29	1.28	14.1	18.05
-16	-0.016	0.984	0.991967741	545	173.566879	13.17447832	26.137315	26	1.43	10.05	14.37
-1	-0.001	0.999	0.999499875	378	120.3821656	10.97188068	21.93278673	22	1.65	8.12	13.40
44	0.044	1.044	1.021763182	480	152.866242	12.36390885	25.26597369	25	1.48	9.15	13.54
-17	-0.017	0.983	0.991463565	645	205.4140127	14.33227172	28.41985042	28	1.32	10.08	13.31
11	0.011	1.011	1.005484958	340	108.2802548	10.40577987	20.92571027	21	1.71	8.08	13.82
-52	-0.052	0.948	0.973652916	620	197.4522293	14.05176961	27.36309291	27	1.37	10.98	15.04
29	0.029	1.029	1.014396372	334	106.3694268	10.31355549	20.92406654	21	1.71	4.39	7.51
57.6	0.0576	1.0576	1.028396811	520.65	165.8121019	12.8768048	26.48492998	26	1.43	10.2	14.59
12	0.012	1.012	1.005982107	386	122.9299363	11.08737734	22.30740644	22	1.65	6.4	10.56
76.5	0.0765	1.0765	1.03754518	235	74.84076433	8.651055677	17.95172224	18	1.91	9.01	17.21
3.3	0.0033	1.0033	1.001648641	432	137.5796178	11.72943382	23.4975429	23	1.59	7.98	12.69
-118	-0.118	0.882	0.939148551	601	191.4012739	13.83478492	25.98583642	26	1.43	10.9	15.59
287	0.287	1.287	1.134460224	489	155.7324841	12.47928219	28.31449855	28	1.32	9.08	11.99
-57	-0.057	0.943	0.971081871	356	113.3757962	10.64780711	20.67978489	21	1.71	8.44	14.43
33	0.033	1.033	1.016366076	557	177.388535	13.31872873	27.07340811	27	1.37	7.91	10.84
2	0.002	1.002	1.0009995	511.39	162.8630573	12.76178112	25.54907305	26	1.43	9.27	13.26
28	0.028	1.028	1.013903348	398	126.7515924	11.25840097	22.82986088	23	1.59	8.01	12.74
-23	-0.023	0.977	0.988433103	647	206.0509554	14.3544751	28.37687674	28	1.32	10.05	13.27
-52.3	-0.0523	0.9477	0.973498844	483	153.8216561	12.40248588	24.14761135	24	1.53	9.91	15.16
55.5	0.0555	1.0555	1.027375297	722	229.9363057	15.1636508	31.15752049	31	1.19	10.88	12.95

-25	-0.025	0.975	0.987420883	258.87	82.44267516	9.079794885	17.93115816	18	1.91	4.39	8.38
-10	-0.01	0.99	0.994987437	704.2	224.2675159	14.97556396	29.80099601	30	1.23	10.8	13.28
5	0.005	1.005	1.002496883	753.27	239.8949045	15.48854107	31.05442828	31	1.19	9.98	11.88
-96.9	-0.0969	0.9031	0.950315737	476	151.5923567	12.31228479	23.40111598	23	1.59	8.43	13.40
33	0.033	1.033	1.016366076	389.25	123.9649682	11.13395564	22.6323496	23	1.59	4.43	7.04
25	0.025	1.025	1.012422837	240	76.43312102	8.742603789	17.70242345	18	1.91	4.39	8.38
94	0.094	1.094	1.045944549	392	124.8407643	11.17321638	23.37312954	23	1.59	8.47	13.47
-62	-0.062	0.938	0.968504001	335	106.6878981	10.3289834	20.0073235	20	1.78	7.08	12.60
-33	-0.033	0.967	0.983361582	535.34	170.4904459	13.05719901	25.67989573	26	1.43	8.5	12.16
-22.7	-0.0227	0.9773	0.988584847	566.46	180.4012739	13.43135413	26.55606635	27	1.37	8.8	12.06
-48.9	-0.0489	0.9511	0.975243559	556.6	177.2611465	13.31394556	25.96867932	26	1.43	10.81	15.46
-13.2	-0.0132	0.9868	0.993378075	485.93	154.7547771	12.44004731	24.7153405	25	1.48	6.08	9.00
-36	-0.036	0.964	0.981835017	429.71	136.8503185	11.69830409	22.97160917	23	1.59	7.08	11.26
6.3	0.0063	1.0063	1.003145054	355.5	113.2165605	10.64032709	21.34758299	21	1.71	7.08	12.11
-6.5	-0.0065	0.9935	0.996744702	353.8	112.6751592	10.61485559	21.16060214	21	1.71	9.08	15.53
22.8	0.0228	1.0228	1.01133575	332.17	105.7866242	10.28526248	20.80370729	21	1.71	8.37	14.31
77	0.077	1.077	1.037786105	348.6	111.0191083	10.53656055	21.86939227	22	1.65	6.85	11.30
18.8	0.0188	1.0188	1.00935623	387.7	123.4713376	11.11176573	22.43145994	22	1.65	7.37	12.16
41.9	0.0419	1.0419	1.020735029	321.5	102.388535	10.11872201	20.65706801	21	1.71	8.08	13.82
5.5	0.0055	1.0055	1.002746229	378.7	120.6050955	10.98203513	22.02438862	22	1.65	9.08	14.98
62.4	0.0624	1.0624	1.030727898	492.9	156.9745223	12.52894737	25.82787118	26	1.43	10.6	15.16
-47.3	-0.0473	0.9527	0.976063523	774.9	246.7834395	15.70934243	30.66663221	31	1.19	10.88	12.95
-50.6	-0.0506	0.9494	0.974371592	671.89	213.977707	14.62797686	28.50617021	29	1.28	10.45	13.38
-30.5	-0.0305	0.9695	0.984631911	899.14	286.3503185	16.92188874	33.32366329	33	1.1	11.86	13.05
-29.6	-0.0296	0.9704	0.985088828	501.79	159.8057325	12.64142921	24.90586138	25	1.48	10.02	14.83
1.1	0.0011	1.0011	1.000549849	452.68	144.1656051	12.00689823	24.02700042	24	1.53	7.08	10.83
38.7	0.0387	1.0387	1.019166326	660.21	210.2579618	14.50027454	29.55638306	30	1.23	10.95	13.47
5.3	0.0053	1.0053	1.002646498	292.07	93.01592357	9.644476324	19.34000082	19	1.84	12.08	22.23
-10.1	-0.0101	0.9899	0.994937184	497.78	158.5286624	12.59081659	25.0541432	25	1.48	8.08	11.96
-15.3	-0.0153	0.9847	0.992320513	647.3	206.1464968	14.35780265	28.49508417	28	1.32	11.47	15.14