DAFTAR PUSTAKA

Bojorquez, J.Z., *et.al.* 2017. What are Normal Relaxation Times of Tissues At 3 T?. *Magnetic Resonance Imaging.* 35: 69 - 80.

Brat, D.J. 2018. Normal Brain Histopathology. In: *Practical Surgical Neuropathology: A Diagnostic Approach.* 2nd ed. Elsevier: Philadelphia.

Bushberg, J.T, *et.al*. 2012. *The Essential Physics of Medical Imaging Third Edition*. Lippincott Williams & Wilkins: Philadelphia.

Cox, L.M, *et.al.* 2019. Calorie Restriction Slows Age-Related Microbiota Changes In An Alzheimer's Disease Model In Female Mice. *Science Reputation*. 9(1):1-15.

Dolz, J., *et.al*. 2020. Deep CNN Ensembles and Suggestive Annotations for Infant Brain MRI Segmentation. *Computation Medical Imaging Graphics*. 79:81.

Lou, B., Jiang, Y., Li, C., Wu, P.Y., Li, S., Qin, B., Chen, H., Wang, R., Wu, B. dan Chen, M. 2021. "Quantitative Analysis of Synthetic Magnetic Resonance Imaging in Alzheimer's Disease". *Frontier in Aging Neuroscience*, 13: 1-7.

Gilmore, A.D., Buser, N.J dan Hanson, J.L. 2021. "Variations in Structural MRI Quality Significantly Impact Commonly Used Measures of Brain Anatomy". *Brain Informatics*, 8(1): 1-15.

Guan, Y., Aamir, M., Rahman, Z., Ali, A., Ahmed, W., Dayo, Z.A., Bhutta, M.S. dan Hu, Z. 2021. "A Framework for Efficient Brain Tumor Classification Using MRI Images". *Mathematical Biosciences and Engineering*, 18(5): 5790-5815.

Hernandez, D. dan Kim, K.N. 2020. "A Review on the RF Coil Designs and Trends for Ultra High Field Magnetic Resonance Imaging". *Investigation Magnetic Resonance Imaging*, 24(3): 95-122.

Huang, B.S. Hsieh, C.Y., Chai W.Y., Lin, Y., Huang Y.L., Lu, K.Y., Chiang, H.J., Schulte, R.F., Lin, C.Y.E. dan Lin, G. 2023." Comparing Magnetic Resonance Fingerprinting (MRF) and the MAGiC Sequence for Simultaneous T1 and T2 Quantitative Measurements in the Female Pelvis: A Prospective Study". *Diagnostics*, 13(13): 1-12.

Kang, J., Ullah, Z. dan Gwak, J. 2021. "MRI-Based Brain Tumor Classification Using Ensemble of Deep Features and Machine Learning Classifiers". *Sensors*, 21(6): 1-21.

Komiyama, M, *et.al.* 1978. MR Imaging : Possibility of Tissue Characterization of Brain Tumors using T1 and T2 values. *AJNR Am J Neuroradiology.* 8(1): 65-70.

Konar, A.S., Paudyal, R., Shah, A.K., Fung, M., Banerjee, S., Dave, A., Lee, N., Hatzoglou, V., Dave, A.S. 2022. "Qualitative and Quantitative Performance of Magnetic Resonance Image Compilation (MAGiC) Method: An Exploratory Analysis for Head and Neck Imaging". *Cancers,* 14(15): 1-13.

Konar, A.S., Shah, A.D., Paudyal, R., Fung, M., Banerjee, S., Dave, A., Hatzoglou, V., Dave, Shukla A. 2022. "Quantitative Synthetic Magnetic Resonance Imaging for Brain Metastases: A Feasibility Study". *Cancers,* 14(11): 1-12.

Knight, M.J., *et.al.* 2016. Quantitative T1 and T2 MRI Signal Characteristics in The Human Brain: Different Patterns of MR Contrasts in Normal Ageing. *Magnetic Resonance Material Physics.* 29 : 833 - 842.

Kotek, G. Nunez-Gonzalez, L., Vigel, M.W., Krestin, G.P., Poot, D.H.J., Tamames, J.A.H. 2021. "From Signal-Based to Comprehensive Magnetic Resonance Imaging". *Scientific Reports*, 11(1): 1-13.

Kumar, A. 2023. "Study and Analysis of Different Segmentation Methods for Brain Tumor MRI Application". *Multimedia Tools and Appicationl*, 82(5): 7117-7139.

Luders, E. dan Toga, A.W. 2010. "Sex Differences in Brain Anatomy". *Progress in Brain Research"*, 186: 1-11.

Mohammed, B.A., Senan, E.M., Aslhammari, T.S., Alreshidi, A., Alyaba, A.M., Alazmi, M. dan Alsagri, A.N. 2023. "Hybrid Techniques of Analyzing MRI Images for Early Diagnosis of Brain Tumours Based on Hybrid Features". *Processes*,11(1): 1-27.

Mohan, P., Veerappampalayam, E.S., Subramani, N., Subramanian, M. dan Meckanzi, S. 2022. "Handcrafted Deep-Feature-Based Brain Tumor Detection and Classification Using MRI Images". *Electron*, 11(24): 1-19.

Perry, C. 2000. Magnetic Resonance Imaging: Principles, Methods and Techniques. Medical Physics Publishing: Madison

Pirki, C.M. 2021. Accelerated 3D Whole Brain, T1, T2 and Proton Density Mapping: Feasibility For Clinical Glioma MR Imaging. *Neuroradiology.* 63: 1831 - 1851.

Sakka L, Coll G dan Chazal J. 2011. Anatomy and Physiology of Cerebrospinal Fluid. E*ur Ann Otorhinolaryngol Head Neck Dis.* 128 (6): 309-316.

Tandel G.S., Biswas, M., Kakde, G.O., Tiwari, A., Suri, H.S., Turk, M., Laird, J.R., Asare, C.K., Ankrah, A.A., Khanna, N.N., Madusudhan, B.K., Saba, L., Suri, J.S. 2019. "A Review on A Deep Learning Perspective in Brain Cancer Classification". *Cancers*, 11(1): 1-32.

Liu,Y., Niu, H., Ren, P., Ren, J., Wei, X., Liu, W., Ding, H., Liu, J., Xia, J., Zhang, T., Lv, Han, Yin, H. dan Wang, Zhenchang. 2022. "Generation of Quantification Maps and Weighted Images from Synthetic Magnetic Resonance Imaging Using Deep Learning Network. *Physics in Medicine and Biology*, 67(2): 1-13.

Thayalan, K. 2014. *The Physics of Radiology and Imaging First Edition.* Jaypee Brothers Medical Publisher: New Delhi.

Wen, H.T., *et.al*. 2023. Surgical Anatomy of The Brain. In: Winn HR, Ed. *Youmans and Winn Neurological Surgery*. 8th ed. Elsevier: Philadelphia.

Xu, Z. 2020. Different Risk Factors in Identical Features of Intracranial Atherosclerosis Plaques in the Posterior and Anterior Circulation in High-Resolution MRI. *Therapeutic Advances in Neurological Disorder.* 13: 1 - 8.

Zhang, K., Zheng, J., Pan, J., Jiang, Y., Zhan, Y., Li, W., Zhang, H. dan Hong, G. 2022. "Axial Spondyloarthritis: Synthetic Magnetic Resonance Imaging in The Detection of Sacroiliac Joint Lesions". *Chinese Medical Journal,* 135(21): 2625-2627.

LAMPIRAN

Lampiran 1. Hasil Pengolahan Data

Lampiran 1.1 Waktu Relaksasi T1 Berdasarkan Usia (Perempuan)

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Materi Putih (*White Matter*)							
1	17	653	701	682	693	634	672,6
2	17	617	713	754	652	639	675
3	20	632	701	716	697	674	684
4	20	701	638	662	699	731	686,2
5	20	749	653	675	667	688	686,4
6	21	672	637	692	706	734	688,2
7	22	714	721	653	682	691	692,2
8	25	653	738	715	689	697	698,4
9	25	681	708	704	696	771	712
10	29	717	697	607	735	821	715,4
11	31	692	689	743	729	753	721,2
12	31	741	705	671	738	721	715,2
13	35	654	729	781	757	741	732,4
14	38	741	696	788	729	712	733,2
15	40	758	736	795	713	769	754,2

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Materi Abu-abu (*Grey Matter*)							
1	17	1144	1254	1238	1137	1173	1189,2
2	17	1265	1281	1193	1251	1178	1233,6
3	20	1344	1273	1267	1265	1294	1288,6
4	20	1295	1267	1288	1271	1369	1298
5	20	1325	1358	1314	1294	1302	1318,6
6	21	1386	1248	1263	1359	1387	1328,6
7	22	1294	1297	1352	1369	1375	1337,4
8	25	1359	1359	1375	1271	1219	1316,6
9	25	1507	1262	1300	1291	1385	1349
10	29	1671	1672	1653	1662	1650	1661,6
11	31	1501	1489	1493	1497	1508	1497,6
12	31	1483	1552	1487	1501	1498	1504,2
13	35	1468	1531	1561	1571	1587	1543,6
14	38	1589	1604	1594	1599	1595	1596,2
15	40	1557	1592	1678	1548	1534	1581,8

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Cairan Serebrospinal							
1	17	3086	3439	3749	3657	3544	3495
2	17	3978	3724	3548	3082	3256	3517,6
3	20	3950	4212	3476	2939	4284	3772,2
4	20	3824	3701	3791	3416	3367	3619,8
5	20	3763	3643	3549	3527	3652	3626,8
6	21	4093	4329	3487	3293	3286	3697,6
7	22	3753	3691	3879	3782	3685	3758
8	25	3791	3756	3892	3823	3829	3818,2
9	25	3958	4284	3681	3676	3627	3845,2
10	29	3286	4273	3079	4015	3912	3713
11	31	3968	4059	3953	4001	3957	3987,6
12	31	4027	4192	3837	3949	3856	3972,2
13	35	3994	3864	3954	4188	4083	4016,6
14	38	4098	4297	4083	4286	4174	4187,6
15	40	4121	4262	4322	4257	4249	4242,2

Lampiran 1.2 Waktu Relaksasi T2 Berdasarkan Usia (Perempuan)

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Materi putih (*White Matter*)							
1	17	68	70	71	73	69	70,2
2	17	65	66	70	77	74	70,4
3	20	69	70	73	70	71	70,6
4	20	69	73	72	71	69	70,8
5	20	71	72	71	70	74	71,6
6	21	74	71	72	73	71	72,2
7	22	72	69	79	71	72	72,6
8	25	65	71	78	72	79	73
9	25	76	77	69	74	72	73,6
10	29	71	73	75	74	76	73,8
11	31	74	77	73	75	71	74
12	31	78	74	73	75	70	74,0
13	35	76	75	77	74	71	74,6
14	38	72	79	78	73	74	75,2
15	40	77	81	75	74	71	75,6

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Materi Abu-abu (*Grey Matter*)							
1	17	79	76	87	89	75	81,2

2	17	82	78	82	85	80	81,4
3	20	79	82	81	84	82	81,6
4	20	85	82	83	79	80	81,8
5	20	82	83	80	84	81	82
6	21	83	82	85	82	79	82,2
7	22	81	83	84	86	84	83,6
8	25	87	84	85	81	82	83,8
9	25	81	85	89	87	79	84,2
10	29	86	87	85	83	84	85
11	31	85	83	90	83	86	85
12	31	89	84	82	85	87	89
13	35	89	86	90	83	85	89
14	38	87	92	87	81	91	87
15	40	88	90	87	89	90	88

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Cairan Serebrospinal							
1	17	548	627	501	739	516	586,2
2	17	863	719	734	662	461	687,8
3	20	817	576	649	843	579	692,8
4	20	827	792	751	697	728	759
5	20	925	1035	587	685	827	811,8
6	21	791	814	894	752	853	820,8
7	22	1677	1689	413	212	341	866,4
8	25	1093	887	716	1265	526	897,4
9	25	1252	942	574	1083	886	947,4
10	29	956	1016	1123	961	865	984,2
11	31	1023	1052	1171	829	994	1013,8
12	31	1077	1021	1039	1012	1123	1054,4
13	35	831	965	1142	1281	1247	1093,2
14	38	1206	1054	1028	1107	1248	1128,6
15	40	1198	1158	1189	1176	1287	1201,6

Lampiran 1.3 Waktu Relaksasi T1 Berdasarkan Usia (Laki-laki)

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Materi Putih (*White Matter*)							
1	18	670	675	726	693	668	686,4
2	18	709	690	703	681	708	698,2
3	19	666	692	714	692	737	700,2
4	19	754	716	719	690	698	715,4
5	20	757	691	723	713	727	722,2

6	21	674	743	774	762	698	730,2
7	23	682	786	758	737	694	731,4
8	24	703	795	723	772	675	733,6
9	25	701	679	769	751	793	738,6
10	29	759	732	682	798	736	741,4
11	32	781	736	772	739	768	759,2
12	32	751	798	872	730	712	772,6
13	33	649	723	847	754	734	741,4
14	35	833	852	834	821	762	820,4
15	42	835	821	823	773	896	829,6

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Materi Abu-abu (*Grey Matter*)							
1	18	1207	1125	1076	1198	1319	1185
2	18	1231	1237	1157	1189	1227	1208,2
3	19	1269	1235	1185	1247	1241	1235,4
4	19	1271	1363	1264	1086	1197	1236,2
5	20	1235	1276	1379	1226	1241	1271,4
6	21	1308	1421	1202	1255	1233	1283,8
7	23	1207	1218	1476	1224	1330	1291
8	24	1308	1373	1355	1254	1231	1304,2
9	25	1296	1329	1213	1351	1362	1310,2
10	29	1362	1335	1348	1349	1229	1324,6
11	32	1476	1284	1289	1237	1235	1476
12	32	1368	1246	1377	1272	1287	1368
13	33	1395	1185	1336	1357	1356	1395
14	35	1381	1319	1389	1383	1329	1381
15	42	1376	1488	1393	1476	1458	1376

No	Usia (tahun)	T1 (ms)					Rata-rata T1 (ms)
Cairan Serebrospinal							
1	18	3842	3813	3729	3548	3637	3713,8
2	18	3786	3738	3746	3642	3794	3741,2
3	19	3927	3789	3724	3651	3775	3773,2
4	19	3873	3821	3825	3826	3762	3821,4
5	20	3789	3843	3879	3898	3984	3878,6
6	21	3846	4084	4187	3967	3764	3969,6
7	23	3964	4192	4094	3965	4179	4078,8
8	24	4168	4265	4119	3981	4115	4129,6
9	25	4227	4198	4268	4223	4278	4238,8

10	29	4287	4295	4281	4289	4196	4269,6
11	32	4338	4385	4374	4377	4389	4372,6
12	32	4387	4285	4282	4469	4478	4380,2
13	33	4319	4329	4472	4496	4382	4399,6
14	35	4464	4482	4368	4437	4393	4428,8
15	42	4565	4593	4593	4518	4579	4569,6

Lampiran 1.4 Waktu Relaksasi T2 Berdasarkan Usia (Laki-laki)

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Materi Putih (*White Matter*)							
1	18	72	71	68	70	69	70
2	18	70	71	71	72	67	70,2
3	19	71	70	69	63	80	70,6
4	19	74	70	67	70	75	71,2
5	20	71	67	73	72	73	71,2
6	21	68	74	72	71	73	71,6
7	23	64	71	71	77	77	72
8	24	72	72	68	71	78	72,2
9	25	73	71	70	72	76	72,4
10	29	74	79	70	77	74	74,8
11	32	75	69	68	74	72	75,2
12	32	66	65	73	75	80	75,6
13	33	73	72	81	71	67	76,2
14	35	79	81	75	72	67	76,8
15	42	74	87	79	78	83	80,2

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Materi Abu-abu (*Grey Matter*)							
1	18	78	77	79	79	76	77,8
2	18	80	81	78	79	74	78,4
3	19	79	77	79	84	80	79,8
4	19	80	81	82	79	80	80,4
5	20	79	79	80	81	84	80,6
6	21	82	86	76	83	77	80,8
7	23	86	85	81	78	76	81,2
8	24	84	86	79	84	80	82,6
9	25	85	76	83	87	85	83,2
10	29	86	88	82	81	82	83,8
11	32	83	81	84	86	88	83
12	32	85	89	74	86	89	85
13	33	78	89	86	88	83	78

14	35	89	84	87	86	81	89
15	42	84	85	90	87	86	84

No	Usia (tahun)	T2 (ms)					Rata-rata T2 (ms)
Cairan Serebrospinal							
1	18	1423	1153	1094	1085	761	1103,2
2	18	1499	1376	1163	970	569	1115,4
3	19	1176	1291	1074	1174	931	1129,2
4	19	1624	1653	772	569	1136	1150,8
5	20	1260	1163	1229	1138	1073	1172,6
6	21	1566	1482	983	976	984	1198,2
7	23	1315	1331	1136	1264	1071	1223,4
8	24	1160	1396	1273	1187	1228	1248,8
9	25	1392	1395	1296	1282	1284	1329,8
10	29	1724	1510	1281	1052	1281	1369,6
11	32	1385	1371	1387	1439	1396	1395,6
12	32	1396	1377	1499	1387	1339	1399,6
13	33	1335	1475	1287	1429	1543	1413,8
14	35	1427	1438	1416	1456	1474	1442,2
15	42	1512	1471	1865	1651	1563	1612,4

Lampiran 1.5 Waktu Relaksasi T1 Berdasarkan Jenis Kelamin

Diketahui :

N1 : *Volunteer* 1
N2 : *Volunteer* 2
N3 : *Volunteer* 3
N4 : *Volunteer* 4
N5 : *Volunteer* 5

Jenis Kelamin	T1 Materi Putih atau *White Matter* (ms)					Rata-rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	672,6	675	684	686,2	686,4	680,84
Laki-Laki	686,4	698,2	700,2	715,4	722,2	704,48

Jenis Kelamin	T1 Materi Abu-abu atau *Grey Matter* (ms)					Rata-rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	1189,2	1233,6	1288,6	1298	1318,6	1265,6
Laki-Laki	1185	1208,2	1235,4	1236,2	1271,4	1227,24

Jenis Kelamin	T1 Cairan Serebrospinal (ms)					Rata-Rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	3495	3517,6	3572,2	3619,8	3626,8	3566,28

Laki-Laki	3713,7	3741,2	3773,1	3821,3	3878,6	3785,58

Lampiran 1.6 Waktu Relaksasi T2 Berdasarkan Jenis Kelamin

Jenis Kelamin	T2 Materi putih atau *White Matter* (ms)					Rata-Rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	68,20	69,40	70,20	71,60	72,40	**70,36**
Laki-Laki	70,8	71,8	72,6	72,8	73,2	**72,240**

Jenis Kelamin	T2 Materi Abu-abu atau *Grey Matter (ms)*					Rata-Rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	81,2	81,4	81,6	81,8	82,4	81,680
Laki-Laki	77,8	78,4	79,8	80,4	80,6	79,400

Jenis Kelamin	T2 Cairan Serebrospinal (ms)					Rata-rata (ms)
	N1	N2	N3	N4	N5	
Perempuan	586,2	687,8	692,8	759	811,8	707,52
Laki-Laki	1103,2	1115,4	1129,2	1150,8	1172,6	1134,24

Lampiran 1.7 Magnetisasi Longitudinal (M_z) dan Transversal (M_{xy}) pada Komponen Jaringan Otak Berdasarkan Usia

Perempuan

No	Usia (Tahun)	M_z/M_o (%)			M_{xy}/M_o (%)		
		Materi Putih (*White Matter)*	Materi Abu-abu (*Grey Matter*)	Cairan Serebro spinal	Materi Putih (*White Matter)*	Materi Abu-abu (*Grey Matter*)	Cairan Serebro spinal
1	17,17	99,74	96,54	68,16	37,60	39,08	48,32
2	17,5	99,73	96,09	67,93	37,63	39,11	48,57
3	20	99,71	95,51	67,36	37,67	39,13	48,58
4	20,25	99,71	95,41	66,88	37,70	39,15	48,70
5	20,4	99,71	95,19	66,81	37,81	39,18	48,78
6	21,25	99,70	95,07	66,10	37,9	39,20	48,79
7	22,75	99,69	94,97	65,51	38,0	39,36	48,85
8	25,17	99,67	94,29	64,92	38,0	39,38	48,89
9	25,42	99,64	93,42	64,66	38,1	39,43	48,95
10	29,67	99,63	93,21	64,02	38,1	39,52	48,99
11	31,25	99,61	93,08	63,33	38,16	39,56	49,02
12	31,33	99,60	93,00	63,28	38,16	39,60	49,06
13	35,33	99,58	92,51	63,06	38,24	39,69	49,09
14	38,583	99,57	91,84	61,53	38,32	39,79	49,12
15	40,5	99,50	92,02	61,05	38,38	39,92	49,17

Laki-laki

No	Usia (Tahun)	M_z/M_o (%)			M_{xy}/M_o (%)		
		Materi Putih (*White Matter)*	Materi Abu-abu (*Grey Matter*)	Cairan Serebro spinal	Materi Putih (*White Matter)*	Materi Abu-abu (*Grey Matter*)	Cairan Serebro spinal
1	18,25	99,71	96,58	65,94	37,57	38,67	49,10
2	18,25	99,67	96,35	65,67	37,60	38,74	49,11
3	19,17	99,67	96,08	65,36	37,67	38,92	49,12
4	19,25	99,63	96,07	64,89	37,76	38,99	49,14
5	20,08	99,61	95,70	64,35	37,76	39,01	49,15
6	21,750	99,58	95,57	63,49	37,82	39,04	49,17
7	23,917	99,58	95,49	62,49	37,87	39,08	49,19
8	24,500	99,57	95,34	62,04	37,90	39,25	49,21
9	25,917	99,56	95,28	61,08	37,93	39,32	49,25
10	29,167	99,56	95,12	60,82	38,27	39,38	49,28
11	32,333	99,48	95,34	59,94	38,32	39,45	49,29
12	32,500	99,44	95,28	59,88	38,38	39,47	49,29
13	33,583	99,33	95,11	59,71	38,46	39,49	49,29
14	35,833	99,24	94,72	59,47	38,54	39,56	49,31
15	42,500	99,19	93,80	58,33	38,96	39,67	49,38

Lampiran 1.8 Magnetisasi Longitudinal (M_z) dan Transversal (M_{xy}) pada Komponen Jaringan Otak Berdasarkan Jenis Kelamin

Jenis Kelamin	M_{xy} Materi Putih (*White Matter*) (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	37,292	37,481	37,604	37,815	37,931	37,292
Laki-Laki	37,695	37,844	37,960	37,989	38,046	37,695

Jenis Kelamin	M_z Materi Putih (*White Matter*) (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	99,749	99,733	99,711	99,706	99,705	99,719
Laki-Laki	99,705	99,675	99,670	99,627	99,607	99,657

Jenis Kelamin	M_{xy} Materi Abu-abu (*Grey Matter*) (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	39,084	39,108	39,131	39,155	39,225	39,141
Laki-Laki	38,666	38,742	38,916	38,989	39,013	38,865

Jenis Kelamin	M_z Materi Abu-abu (*Grey Matter*) (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	96,539	96,094	95,514	95,412	95,185	95,749

Laki-Laki	96,580	96,351	96,075	96,067	95,698	96,154

Jenis Kelamin	M_{xy} Cairan Serebrospinal (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	48,323	48,567	48,577	48,700	48,783	48,590
Laki-Laki	49,102	49,111	49,122	49,139	49,154	49,126

Jenis Kelamin	M_z Cairan Serebrospinal (%)					Rata-Rata (%)
	N1	N2	N3	N4	N5	
Perempuan	68,161	67,926	67,364	66,880	66,809	67,428
Laki-Laki	65,942	65,671	65,359	64,893	64,346	65,242

Lampiran 1.9 Pengolahan Data Magnetisasi Longitudinal (M_z) berdasarkan Waktu Relaksasi T1

Diketahui :
T1 = 672,6 ms
TR = 4000 ms
Ditanyakan :
M_Z = ……. ?
Penyelesaian :

$$M_z = M_o\left(1 - e^{-\left(\frac{TR}{T1}\right)}\right)$$

$$\frac{M_z}{M_o} = \left(1 - e^{-\left(\frac{4000}{672,6}\right)}\right)$$

$$\frac{M_z}{M_o} = \left(1 - e^{-(5,947)}\right)$$

$$\frac{M_z}{M_o} = (1 - 0,002613)$$

$$\frac{M_z}{M_o} = 0,9979$$

atau

$$\frac{M_z}{M_o} = 99,79\%$$

M_o dapat dikatakan sebagai magnetisasi maksimum atau sama dengan 1, maka:
M_Z = 99,79%

Lampiran 1.10 Pengolahan Data Magnetisasi Longitudinal (M_{xy}) berdasarkan Waktu Relaksasi T2

Diketahui :
T2 = 70,2 ms
TE = 20 ms
Ditanyakan :
M_{XY} = ……. ?
Penyelesaian :

Karena TE = 20 ms dengan sinyal RF = 180^o untuk 1 kali pemberian TE, maka untuk TE* dimana r = 2

$$M_{xy} = M_o\left(e^{-\left(\frac{TE}{T2}\right)}\right)$$

$$\frac{M_{xy}}{M_o} = \left(e^{-\left(\frac{20}{70,2}\right)}\right)$$

$$\frac{M_{xy}}{M_o} = 0,7514$$

Karena sinyal diberikan 90^0 maka dikalikan dengan 1/r atau 1/2, sehingga

$$\frac{M_{xy}}{M_o} = 0,7514 \times \frac{1}{2}$$

$$\frac{M_{xy}}{M_o} = 0,3757$$

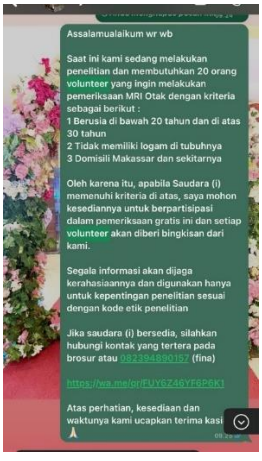
atau

$$\frac{M_{xy}}{M_o} = 37,57\%$$

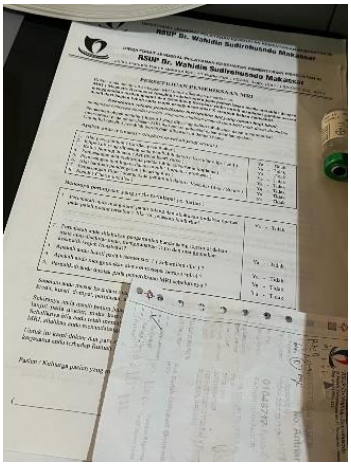
M_o dapat dikatakan sebagai magnetisasi maksimum atau sama dengan 1, maka:
M_{XY} = 37,57%

Lampiran 2. Dokumentasi Kegiatan

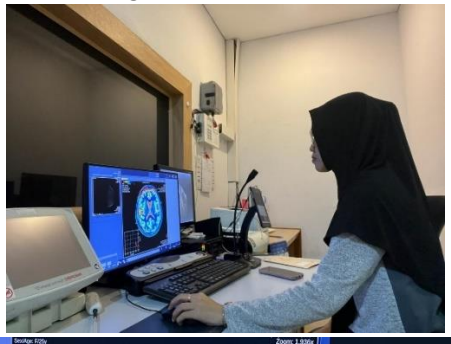
Lampiran 2.1 Dokumentasi Pencarian *Volunteer*

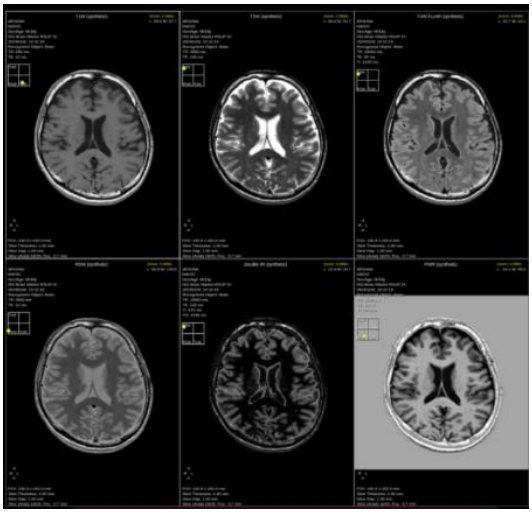


Lampiran 2.2 Dokumentasi Sebelum dan Selama Pemeriksaan

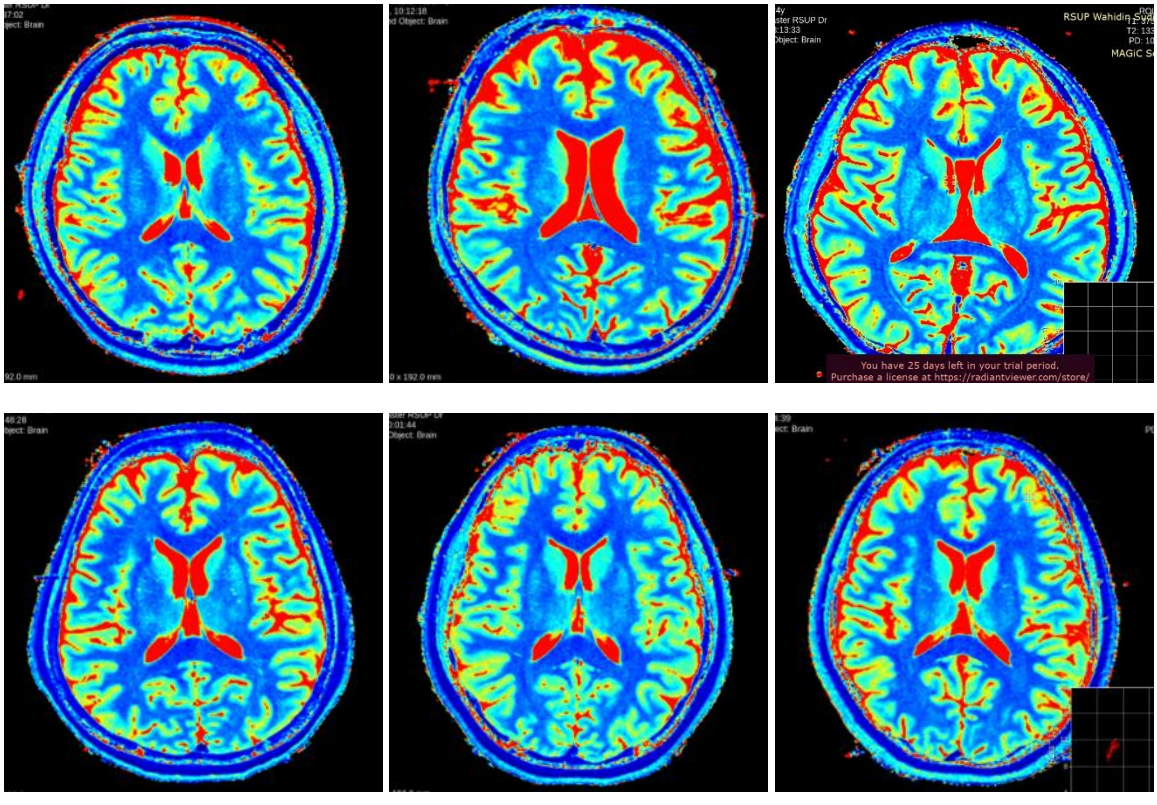


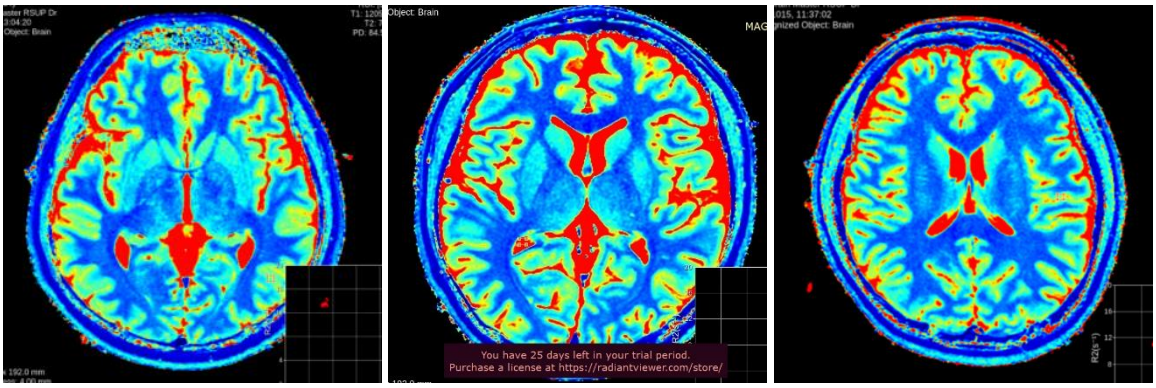
Lampiran 2.3 Dokumentasi Pengolahan Data Pemeriksaan





Lampiran 2.4 Dokumentasi Hasil Pemeriksaan




Object: Brain
You have 25 days left in your trial period.
Purchase a license at https://radiantviewer.com/store/