

# **CHAPTER 8**

# **HAEMODIALYSIS PRACTICES**

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**SECTION 8.1: VASCULAR ACCESS AND ITS COMPLICATIONS**

The proportion of patients undergoing haemodialysis (HD) using a fistula has been consistently and gradually reducing for the past 10 years. It was 86.1% in 2014 and was only 75.7% in 2023. This is most likely caused by a significant proportion of incident dialysis cases not having a functioning fistula upon initiation of HD, and the increasing number of elderly and diabetic patients without permanent vascular access, dialysing with dialysis catheters. There is no doubt that creating wrist AVF is more challenging among elderly and diabetic patients with small vessels. The number of patients undergoing HD using BCF has overtaken those using wrist AVF since 2022.

The development of interventional nephrology has brought an increase in patients undergoing HD via cuffed-HD catheters and non-cuffed catheters. The number of patients undergoing HD via cuffed-HD catheters has overtaken the number of patients using non-cuffed HD catheters in 2023, i.e., 12.2% vs 11.3%.

**Table 8.1.1: Vascular access on haemodialysis, 2014-2023**

Access types	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	18346	34	17907	35.8	19073	37.6	19562	39.5	19657	41.4
BCF*	20443	37.9	18851	37.7	19093	37.6	18499	37.4	17783	37.5
BBF*	2049	3.8	1801	3.6	1740	3.4	1615	3.3	1526	3.2
Graft	421	0.8	444	0.9	448	0.9	490	1	527	1.1
HD Catheter – Cuffed	6575	12.2	5512	11	5187	10.2	4542	9.2	3812	8
HD Catheter – Non-Cuffed	6100	11.3	5488	11	5238	10.3	4810	9.7	4144	8.7
Total	53934	100	50003	100	50779	100	49518	100	47449	100

Access types	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	19176	42.8	18905	44.1	17997	44.9	16121	46.9	15540	48.8
BCF*	16751	37.4	16205	37.8	14956	37.3	12546	36.5	11222	35.2
BBF*	1340	3	1184	2.8	950	2.4	784	2.3	665	2.1
Graft	567	1.3	576	1.3	557	1.4	551	1.6	559	1.8
HD Catheter – Cuffed	3313	7.4	3028	7.1	2662	6.6	1947	5.7	1672	5.3
HD Catheter – Non-Cuffed	3605	8.1	3011	7	2971	7.4	2398	7	2182	6.9
Total	44752	100	42909	100	40093	100	34347	100	31840	100

\*AVF = arteriovenous fistula, BBF = brachio basilic fistula, BCF = brachiocephalic fistula

There was no increase in difficulties reported with vascular access.

**Table 8.1.2: Difficulties reported with vascular access, 2014-2023**

Access difficulty	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	706	1.3	672	1.4	748	1.5	870	1.8	404	1.1
Difficulty in obtaining desired blood flow rate	804	1.5	815	1.7	939	1.9	1138	2.4	516	1.4
Other difficulties	211	0.4	225	0.5	242	0.5	274	0.6	68	0.2
No difficulties	51891	96.8	47451	96.5	47510	96.1	46081	95.3	35036	97.3
Total	53612	100	49163	100	49439	100	48363	100	36024	100

Access difficulty	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	360	1.2	513	2	547	1.5	554	1.7	656	2.2
Difficulty in obtaining desired blood flow rate	419	1.4	517	2.1	495	1.4	470	1.4	488	1.6
Other difficulties	49	0.2	71	0.3	82	0.2	74	0.2	78	0.3
No difficulties	29661	97.3	23961	95.6	35230	96.9	32371	96.7	29288	96
Total	30489	100	25062	100	36354	100	33469	100	30510	100

Complication risk remains less than 7% for the past 9 years, and the 3 commonest complications were aneurysmal dilatation, venous outflow obstruction and thrombosis of fistula.

**Table 8.1.3: Complications reported with vascular access, 2014-2023**

Complication	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	318	0.6	256	0.5	440	0.9	541	1.1	196	0.5
Bleed	121	0.2	102	0.2	111	0.2	144	0.3	48	0.1
Aneurysmal dilatation	660	1.2	612	1.2	642	1.3	680	1.4	56	0.2
Swollen limb	188	0.4	177	0.4	185	0.4	227	0.5	74	0.2
Access related infection, local/systemic	158	0.3	149	0.3	230	0.5	263	0.5	105	0.3
Distal limb ischaemia	23	0.0	35	0.1	41	0.1	30	0.1	9	0
Venous outflow obstruction	540	1.0	565	1.1	604	1.2	593	1.2	184	0.5
Carpal tunnel	27	0.1	25	0.1	29	0.1	26	0.1	4	0
Others	299	0.6	313	0.6	315	0.6	402	0.8	102	0.3
No complications	51376	95.7	47071	95.5	46995	94.8	45576	94	35128	97.8
Total	53710	100	49305	100	49592	100	48482	100	35906	100

Complication	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	184	0.6	387	1.5	576	1.6	551	1.6	552	1.8
Bleed	53	0.2	70	0.3	79	0.2	66	0.2	84	0.3
Aneurysmal dilatation	58	0.2	369	1.5	511	1.4	488	1.4	520	1.7
Swollen limb	65	0.2	116	0.5	160	0.4	159	0.5	200	0.6
Access related infection, local/systemic	133	0.4	167	0.7	205	0.6	189	0.6	181	0.6
Distal limb ischaemia	11	0	24	0.1	37	0.1	49	0.1	33	0.1
Venous outflow obstruction	127	0.4	315	1.3	385	1.1	367	1.1	425	1.4
Carpal tunnel	2	0	24	0.1	42	0.1	35	0.1	41	0.1
Others	69	0.2	158	0.6	172	0.5	171	0.5	210	0.7
No complications	29682	97.7	23531	93.5	34267	94.1	32206	93.9	28989	92.8
Total	30384	100	25161	100	36434	100	34281	100	31235	100

**Table 8.1.4: Percent vascular access at first HD (Fistula+AVG) of all HD starts by State in Malaysia, 1 January 2023 - 31st December 2023**

State	Fistula	AVG	Temporary catheter	Permcath	Unknown	Total	% (Fistula + AVG)/ Total	% Catheters
Malaysia	4307	21	2577	987	258	8150	53.1	43.7
Kedah	221	0	336	90	22	669	33	63.7
Pulau Pinang	219	1	227	76	35	558	39.4	54.3
Terengganu	125	0	127	47	9	308	40.6	56.5
Perlis	23	0	19	8	6	56	41.1	48.2
WP Putrajaya & KL	267	3	190	112	22	594	45.5	50.8
Melaka	152	0	132	44	3	331	45.9	53.2
Pahang	191	2	181	29	8	411	47	51.1
Negeri Sembilan	176	1	145	38	8	368	48.1	49.7
Selangor	845	9	526	231	31	1642	52	46.1
Perak	369	0	203	105	14	691	53.4	44.6
Sarawak	292	0	155	63	34	544	53.7	40.1
Kelantan	254	1	143	51	10	459	55.6	42.3
Sabah WP Labuan	205	2	94	20	20	341	60.7	33.4
Johor	968	2	99	73	36	1178	82.3	14.6

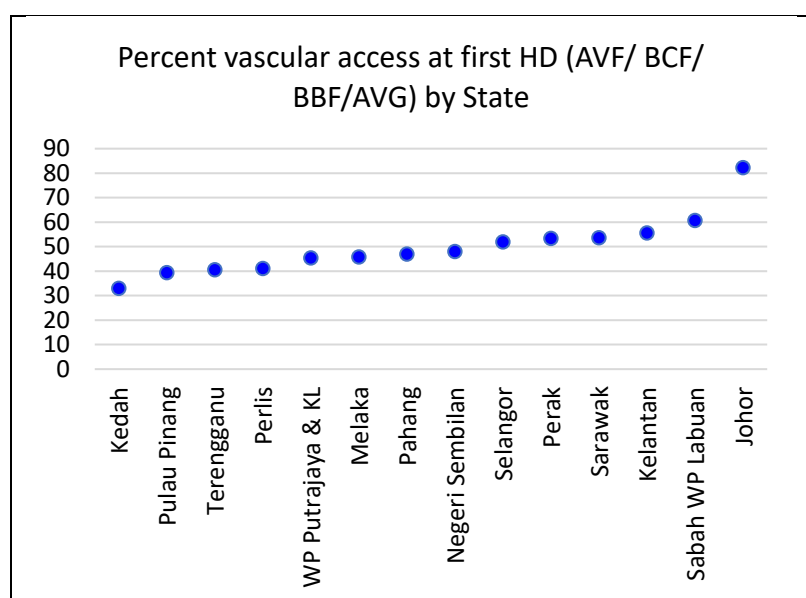
Fistula = AVF + BBF + BCF

Temporary catheter = non cuffed catheter

Permcath = Cuffed catheter

In year 2023, 53.1% of patients started HD via fistula or AVG in Malaysia. The states of Kedah and Pulau Pinang recorded the lowest number of patients starting HD via fistula or AVG (<40%). The state of Johor did well, with 82.3% of patients initiating HD via fistula or AVG. Other states in Malaysia ranged between 40-60%.

**Figure 8.1.4: Percent vascular access at first HD (Fistula+AVG) of all HD starts by State in Malaysia, 1 January 2023 - 31st December 2023**



**SECTION 8.2: HD PRESCRIPTION**

More than 90% of the patients were undergoing HD with the blood flow rate of >250ml/min for the past 10 years. Majority of the patients were being dialysed with Qb 300-349ml/min.

**Table 8.2.1: Blood flow rates in HD centres, 2014-2023**

Blood flow rates (ml/min)	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
<150	35	0.1	16	0.1	16	0.1	9	0	14	0.1
150-199	383	0.7	177	0.6	265	0.9	262	1	204	0.8
200-249	3529	6.5	1470	4.7	2118	6.9	1950	7.4	1601	6.5
250-299	18193	33.7	8171	26.4	9905	32.2	8247	31.4	7069	28.8
300-349	24545	45.5	15255	49.2	13960	45.3	11787	44.9	11449	46.6
≥350	7273	13.5	5920	19.1	4540	14.7	3976	15.2	4220	17.2
Total	53958	100	31009	100	30804	100	26231	100	24557	100

Blood flow rates (ml/min)	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
<150	18	0.1	30	0.1	51	0.1	24	0.1	23	0.1
150-199	239	1.2	185	0.8	278	0.8	216	0.6	164	0.5
200-249	1460	7.2	1621	6.9	2133	5.8	1878	5.5	1703	5.4
250-299	6255	30.8	7206	30.9	9674	26.2	8557	25	8088	25.6
300-349	8788	43.2	9635	41.3	15716	42.6	14515	42.4	13081	41.4
≥350	3575	17.6	4658	20	9017	24.5	9062	26.5	8532	27
Total	20335	100	23335	100	36869	100	34252	100	31591	100

More than 97% of the HD patients had 3 sessions of HD per week for the past 10 years. Besides, >98% of them were dialysed for 4 hours during each session.

**Table 8.2.2: Number of HD sessions per week, 2014-2023**

HD sessions per week	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
1	100	0.2	54	0.2	39	0.1	88	0.3	122	0.5
2	1033	1.9	321	1	545	1.8	502	1.9	452	1.8
3	52607	97.5	30519	98.4	30061	97.6	25555	97.4	23858	97.4
4	210	0.4	108	0.3	159	0.5	85	0.3	67	0.3
≥5	2	0	0	0	0	0	1	0	2	0
Total	53952	100	31002	100	30804	100	26231	100	24501	100

HD sessions per week	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
1	62	0.3	75	0.3	67	0.2	16	0	33	0.1
2	441	2.2	528	2.3	479	1.3	466	1.4	528	1.7
3	19762	97.3	22644	97	36232	98	33709	98.1	31018	97.7
4	53	0.3	84	0.4	165	0.4	132	0.4	138	0.4
≥5	1	0	4	0	13	0	43	0.1	44	0.1
Total	20319	100	23335	100	36956	100	34366	100	31761	100

**Table 8.2.3: Duration of HD, 2014-2023**

Duration of HD per session (hours)	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
≤3	364	0.7	169	0.5	214	0.7	146	0.6	112	0.5
3.5	194	0.4	95	0.3	172	0.6	82	0.3	89	0.4
4	53341	98.9	30702	99	30389	98.7	25959	99	24252	99
4.5	47	0.1	35	0.1	22	0.1	38	0.1	33	0.1
5	7	0	1	0	7	0	5	0	8	0
>5	0	0	0	0	0	0	1	0	0	0
Total	53953	100	31002	100	30804	100	26231	100	24494	100

Duration of HD per session (hours)	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
≤3	74	0.4	117	0.5	183	0.5	121	0.4	113	0.4
3.5	41	0.2	72	0.3	88	0.2	78	0.2	83	0.3
4	20161	99.2	23133	99	36614	99.1	34085	99.2	31479	99.1
4.5	34	0.2	44	0.2	53	0.1	62	0.2	39	0.1
5	9	0	12	0.1	23	0.1	27	0.1	40	0.1
>5	1	0	0	0	3	0	3	0	3	0
Total	20320	100	23378	100	36964	100	34376	100	31757	100

Synthetic membrane type remained the preferred choice for most HD centres compared to other membrane types.

**Table 8.2.4: Dialyser membrane types in HD centres, 2014-2023**

Dialyser membrane	2023		2022		2021		2020		2019	
	n	%	n	%	n	%	n	%	n	%
Cellulosic membranes	981	1.8	931	3	1021	3.3	717	2.7	914	3.6
Synthetic membranes	44872	83	25982	83.3	25349	82.2	21806	83.1	20931	82.9
Unknown	8233	15.2	4291	13.8	4434	14.4	3708	14.1	3404	13.5
Total	54086	100	31204	100	30804	100	26231	100	25249	100

Dialyser membrane	2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%
Cellulosic membranes	1069	5.1	1623	6.6	3194	1069	5.1	1623	6.6	3194
Synthetic membranes	17324	83	18707	75.8	25189	17324	83	18707	75.8	25189
Unknown	2493	11.9	4366	17.7	8657	2493	11.9	4366	17.7	8657
Total	20886	100	24696	100	37040	20886	100	24696	100	37040

Single use dialyser is getting more popular over the past 10 years, increasing steadily from 13.1% in 2014 to 30.3% in 2023.

**Table 8.2.5: Dialyser reuse frequency in HD centres, 2014-2023**

Dialyser reuse frequency	2023		2022		2021		2020	
	n	%	n	%	n	%	n	%
Single use	13701	30.3	5743	24.8	6581	23.8	5583	23.8
Reuse	31504	69.7	17445	75.2	21056	76.2	17827	76.2
Total	45205	100	23188	100	27637	100	23410	100

Dialyser reuse frequency	2019		2018		2017		2016		2015		2014	
	n	%	n	%	n	%	n	%	n	%	n	%
Single use	4437	19.5	3716	19.1	3662	16.3	4730	13.8	4711	14.5	3919	13.1
2	17	0.1	8	0	26	0.1	136	0.4	51	0.2	34	0.1
3	85	0.4	92	0.5	137	0.6	410	1.2	220	0.7	165	0.6
4	42	0.2	41	0.2	58	0.3	171	0.5	109	0.3	93	0.3
5	142	0.6	85	0.4	159	0.7	517	1.5	270	0.8	180	0.6
6	355	1.6	379	2	339	1.5	897	2.6	760	2.3	683	2.3
7	200	0.9	263	1.4	210	0.9	459	1.3	436	1.3	582	1.9
8	1284	5.6	825	4.2	1006	4.5	1632	4.8	1439	4.4	1580	5.3
9	116	0.5	30	0.2	64	0.3	96	0.3	167	0.5	170	0.6
10	2707	11.9	2230	11.5	2945	13.1	4474	13	4630	14.2	4238	14.1
11	55	0.2	51	0.3	42	0.2	120	0.3	106	0.3	103	0.3
12	6799	29.9	4932	25.4	7112	31.7	10038	29.3	9641	29.6	9112	30.4
≥13	6508	28.6	6769	34.9	6645	29.7	10611	30.9	10047	30.8	9124	30.4
Total	22747	100	19421	100	22405	100	34291	100	32587	100	29983	100

The mean and median delivered Kt/V was 1.5 in year 2023. Seventy two percent of the patients had a delivered Kt/V of at least 1.3 in 2023.

**Table 8.2.6(a): Distribution of delivered Kt/V, HD patients 2019-2023**

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥1.2	% patients ≥1.3
2023	51102	1.5	0.3	1.5	1.3	1.7	85	72
2022	48626	1.5	0.3	1.5	1.3	1.7	85	72
2021	47980	1.5	0.3	1.5	1.3	1.7	83	69
2020	45758	1.5	0.3	1.5	1.3	1.7	85	72
2019	42764	1.6	1.4	1.5	1.3	1.7	87	75

The mean and median Urea reduction ratio (URR) was 70.5 and 71.1 respectively in 2023. Fifty six percent of patient achieved URR ≥ 70%.

**Table 8.2.6(b): Distribution of URR, HD patients 2019-2023**

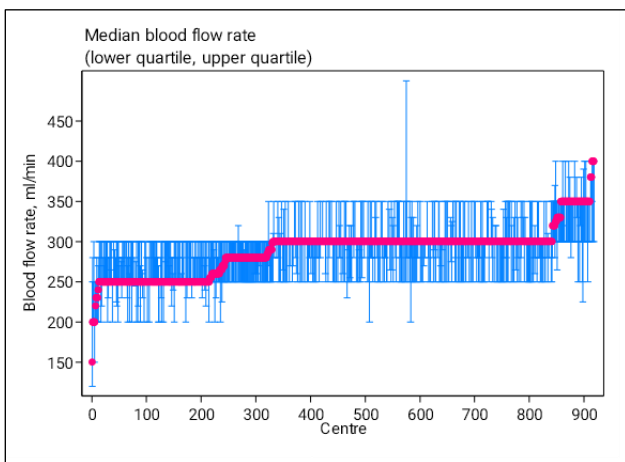
Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 65%	% patients ≥ 70%
2023	51102	70.5	7.7	71.1	65.8	76	78	56
2022	48626	70.5	7.8	71.2	65.9	76	78	56
2021	47980	69.9	8	70.6	65.2	75.5	76	53
2020	45758	70.6	7.9	71.3	65.9	76.2	78	56
2019	42747	71.1	8	71.7	66.4	76.6	80	59

The median blood flow rates in HD centres remain the same for the past 10 years, i.e. 300ml/min. The minimum blood flow rate remains less than 200ml/min for the past 4 years.

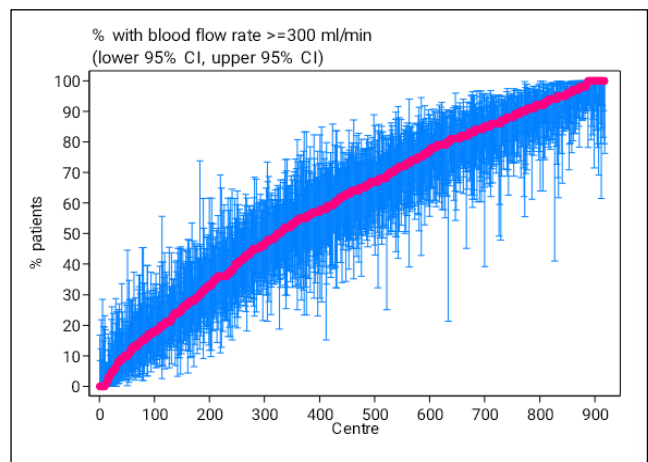
**Table 8.2.7(a): Variation in median blood flow rates in HD patients, HD centres, 2014-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	918	150	250	260	300	300	350	400
2022	736	180	250	280	300	300	350	400
2021	726	150	250	260	300	300	350	400
2020	663	150	250	260	300	300	350	400
2019	633	200	250	280	300	300	350	400
2018	591	200	250	250	300	300	350	400
2017	631	200	250	280	300	300	350	400
2016	699	180	250	300	300	320	350	400
2015	677	150	250	300	300	330	350	400
2014	647	170	250	300	300	335	375	400

**Figure 8.2.7(a): Variation in median blood flow rates in HD patients among centres 2023**



**Figure 8.2.7(b): Variation in Proportion of patients with blood flow rates  $\geq 300$  ml/min among HD centres 2023**



There was one centre with median blood flow rate of  $\leq 200$ ml/min. There was a wide variation in the proportion of patients with a blood flow rate of  $\geq 300$ ml/min. There were centres with none of their patients with a blood flow rate of  $\geq 300$ ml/min.



The median for the proportion of patients with blood flow rates of  $\geq 300$  ml/min in centres had dropped to 64 in 2023 from 76 in 2022.

**Table 8.2.7(b): Proportion of patients with blood flow rates  $\geq 300$  ml/min, HD centres 2014-2023**

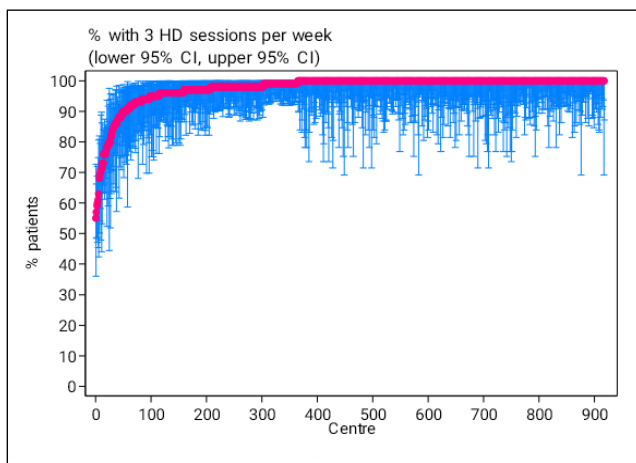
Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	918	0	10	36	64	84	98	100
2022	736	0	16	49	76	90	100	100
2021	726	0	7	36	64	85	98	100
2020	663	0	9	39	66	84	98	100
2019	633	0	11	42	69	86	100	100
2018	591	0	6	39	66	87	100	100
2017	631	0	11	47	70	88	100	100
2016	699	0	19	55	78	92	100	100
2015	677	0	22	58	78	91	100	100
2014	647	0	21	58	77	90	100	100

The majority of centres had 100% of their patients with 3 HD sessions/week. There were a few centres with less than 60% of their patients on 3 HD sessions per week.

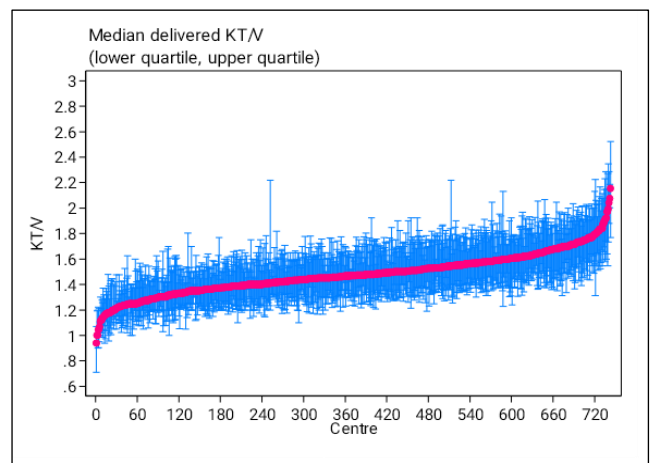
**Table 8.2.7(c): Proportion of patients with 3 HD sessions per week, HD centres 2014-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	918	55	88	98	100	100	100	100
2022	736	42	91	99	100	100	100	100
2021	726	6	86	98	100	100	100	100
2020	663	34	88	98	100	100	100	100
2019	632	0	87	98	100	100	100	100
2018	591	30	86	99	100	100	100	100
2017	629	39	88	97	100	100	100	100
2016	699	17	92	98	100	100	100	100
2015	677	50	92	98	100	100	100	100
2014	647	20	90	98	100	100	100	100

**Figure 8.2.7(c): Variation in proportion of patients with 3 HD sessions per week among HD centres 2023**



**Figure 8.2.7(d): Variation in median delivered Kt/V in HD patients among HD centres 2023**



The median delivered Kt/V was 1.5. The median delivered Kt/V in HD patients among HD centres in 2023 ranged from 0.9 to 2.2. Half of the centres had 88% of their patients with a delivered Kt/V  $\geq 1.2$  in 2023. There was one centre with less than 10% of their patients with a delivered Kt/V  $\geq 1.2$ .

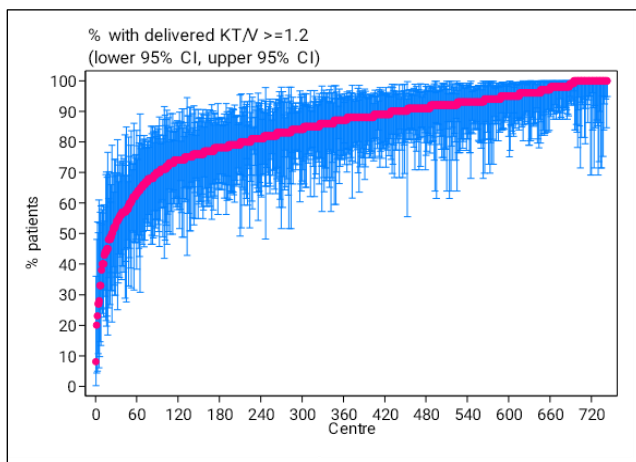
**Table 8.2.7(d): Median delivered Kt/V in HD patients, HD centres 2019-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	743	0.9	1.2	1.4	1.5	1.6	1.7	2.2
2022	691	1	1.2	1.4	1.5	1.6	1.8	2.1
2021	653	1	1.2	1.4	1.5	1.6	1.7	3
2020	611	1.1	1.2	1.4	1.5	1.6	1.8	2.1
2019	581	1.1	1.3	1.4	1.5	1.6	1.8	4

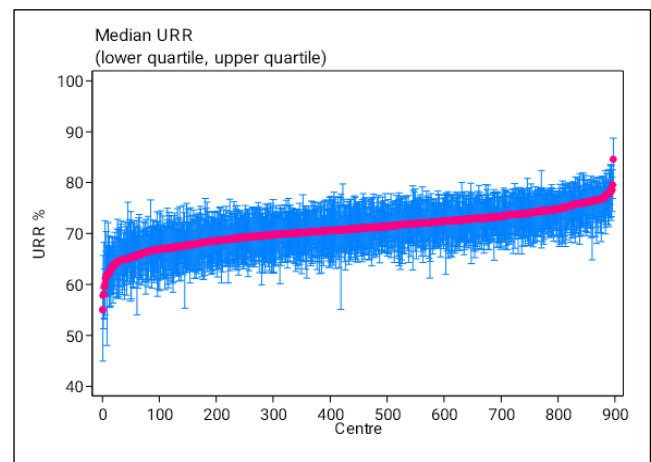
**Table 8.2.7(e): Proportion of patients with delivered Kt/V  $\geq 1.2$ , HD centres 2019-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	743	8	56	78	88	93	100	100
2022	691	15	60	79	88	94	100	100
2021	653	24	53	76	85	93	100	100
2020	611	26	58	79	88	94	100	100
2019	581	20	64	82	90	95	100	100

**Figure 8.2.7(e): Variation in proportion of patients with delivered Kt/V  $\geq 1.2$ , HD centres 2023**



**Figure 8.2.7(f): Variation in median URR among HD patients, HD centres 2023**



The median URR for 2023 was 71%. The median URR in HD patients among HD centres in 2023 range from 55.1 to 84.6. Half of the centres had 80% of their patients with URR  $\geq$ 65%. There was one centre with less 10% of their patients with URR  $\geq$ 65%.

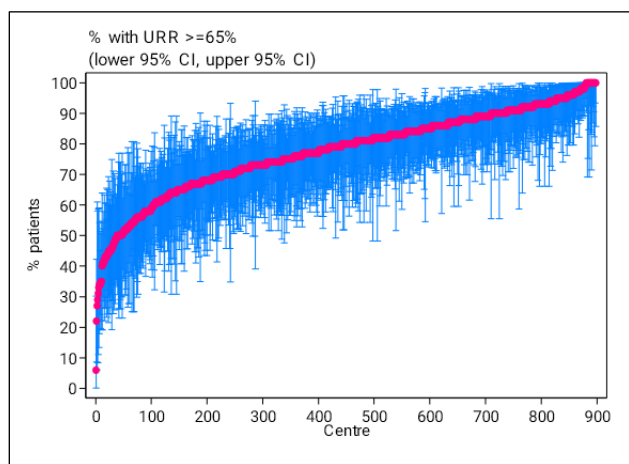
**Table 8.2.7(f): Median URR among HD patients, HD centres 2019-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	897	55.1	65.1	68.9	71	73.1	76.2	84.6
2022	837	59.7	65.3	68.7	71.1	73.3	76	82.6
2021	798	58	64.5	68.3	70.6	72.6	76	81.3
2020	764	58.8	64.6	68.6	71.1	73.7	76.8	81.3
2019	741	60	65.7	69.5	71.6	73.9	76.8	95.8

**Table 8.2.7(g): Proportion of HD patients with URR  $\geq$ 65%, HD centres 2019-2023**

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2023	897	7	50	69	80	88	96	100
2022	837	27	50	69	81	89	96	100
2021	798	17	46	67	78	87	96	100
2020	764	21	47	68	80	89	98	100
2019	741	7	54	72	82	90	98	100

**Figure 8.2.7(g): Variation in proportion of patients with URR  $\geq$ 65% among HD centres 2023**



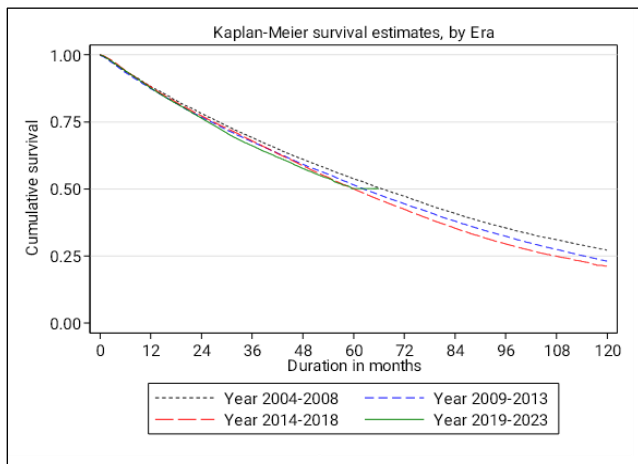
**SECTION 8.3: TECHNIQUE SURVIVAL ON DIALYSIS**

There was no apparent difference in the unadjusted technique survival by years of starting dialysis for the years 2003 to 2022 even after censoring for death and transplant.

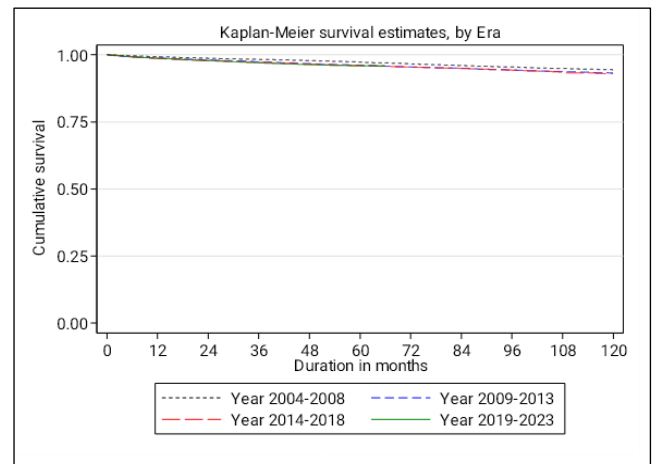
**Table 8.3.1(a): Unadjusted technique survival by era, 2004-2023**

Year Interval (month)	2004-2008			2009-2013			2014-2018			2019-2023		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17042	100		27828	100		36842	100		42621	100	
6	15849	94	0	25682	93	0	34218	94	0	35648	94	0
12	14736	88	0	23860	87	0	31685	88	0	28794	88	0
24	12857	78	0	20686	77	0	27341	77	0	18233	76	0
36	11268	69	0	18022	68	0	23717	68	0	10409	66	0
48	9861	61	0	15602	59	0	20219	59	0	4518	58	0
60	8614	54	0	13463	52	0	17048	50	0	58	50	1
72	7518	47	0	11498	44	0	11382	42	0	1		
84	6435	41	0	9735	38	0	7069	35	0	1		
96	5545	35	0	8199	32	0	3826	30	0	1		
108	4825	31	0	6871	27	0	1549	25	0	1		
120	4178	27	0	5714	23	0	19	21	0	1		

**Figure 8.3.1(a): Unadjusted technique survival by year of entry, 2004-2023**



**Figure 8.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2004-2023**



**Table 8.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2004-2023**

Year Interval (month)	2004-2008			2009-2013			2014-2018			2019-2023		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17042	100		27828	100		36842	100		42621	100	
6	15849	100	0	25682	99	0	34218	99	0	35648	99	0
12	14736	99	0	23860	99	0	31685	99	0	28794	99	0
24	12857	99	0	20686	98	0	27341	98	0	18233	98	0
36	11268	98	0	18022	97	0	23717	97	0	10409	97	0
48	9861	98	0	15602	97	0	20219	97	0	4518	96	0
60	8614	97	0	13463	96	0	17048	96	0	58	96	0
72	7518	97	0	11498	96	0	11382	95	0	1		
84	6435	96	0	9735	95	0	7069	95	0	1		
96	5545	96	0	8199	94	0	3826	94	0	1		
108	4825	95	0	6871	94	0	1549	93	0	1		
120	4178	94	0	5714	93	0	19	93	0	1		

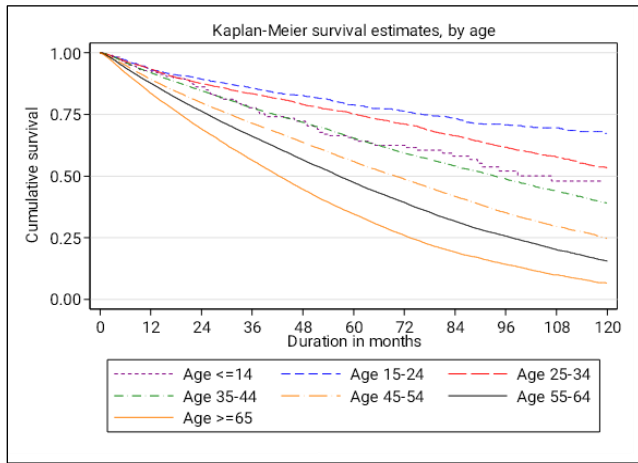
There was no apparent difference in the unadjusted technique survival by age once censored for death & transplant except for those less than 15 years old. Patients who were less than 15 years old had poorer technique survival compared to all other age group. The 9 years unadjusted technique survival (censored for death & transplant) for the age groups of ≤14, 15-24, 25-34, 35-44, 44-54, 55-64 and ≥65 years old were 86%, 90%, 92%, 92%, 94%, 93% and 95% respectively.

**Table 8.3.2(a): Unadjusted technique survival by age, 2014-2023**

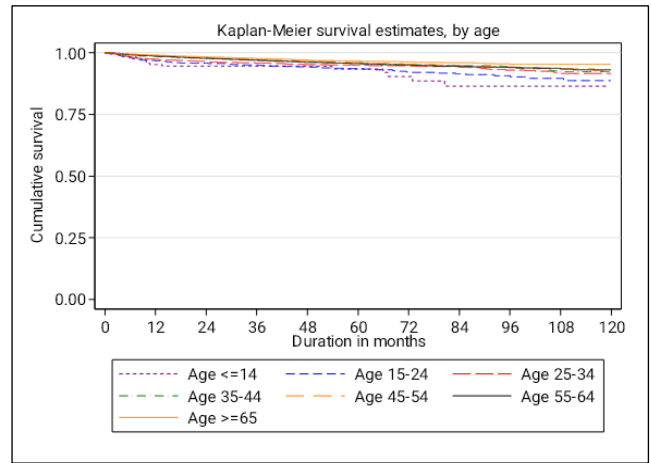
Age group (year) Interval (month)	≤ 14			15-24			25-34			35-44		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	220	100		1497	100		4646	100		9235	100	
6	188	96	1	1328	97	0	4001	97	0	7922	96	0
12	169	93	2	1184	93	1	3545	93	0	6954	92	0
24	139	86	3	983	89	1	2800	87	1	5400	84	0
36	117	78	3	818	86	1	2289	83	1	4197	77	1
48	98	72	4	682	83	1	1827	78	1	3202	72	1
60	71	63	4	546	79	1	1390	74	1	2277	65	1
72	52	62	4	419	77	1	1001	70	1	1602	59	1
84	36	57	4	302	74	2	715	65	1	1103	53	1
96	20	49	5	199	71	2	418	60	1	662	48	1
108	11	43	6	104	70	2	191	57	1	264	43	1
120	1			10	64	4	9	54	2	9	40	2

Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17700	100		25301	100		23192	100	
6	15313	95	0	21751	94	0	19373	92	0
12	13397	89	0	18889	88	0	16343	84	0
24	10361	80	0	14338	76	0	11557	69	0
36	8084	71	0	10620	66	0	8004	57	0
48	6073	64	0	7595	57	0	5268	45	0
60	4375	56	0	5234	48	0	3217	34	0
72	3005	49	1	3421	39	0	1886	26	0
84	1910	41	1	1990	31	0	1016	19	0
96	1046	34	1	1038	25	0	487	14	0
108	434	29	1	396	20	1	156	10	0
120	19	25	1	6	17	1	9	7	1

**Figure 8.3.2(a): Unadjusted technique survival by age, 2014-2023**



**Figure 8.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2014-2023**



**Table 8.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2014-2023**

Age group (year) Interval (month)	≤ 14			15-24			25-34			35-44		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	220	100		1497	100		4646	100		9235	100	
6	188	98	1	1328	98	0	4001	98	0	7922	99	0
12	169	95	2	1184	97	0	3545	97	0	6954	99	0
24	139	95	2	983	96	1	2800	96	0	5400	98	0
36	117	95	2	818	95	1	2289	96	0	4197	97	0
48	98	95	2	682	94	1	1827	95	0	3202	96	0
60	71	93	2	546	94	1	1390	95	0	2277	96	0
72	52	90	3	419	92	1	1001	95	0	1602	95	0
84	36	86	4	302	91	1	715	94	0	1103	95	0
96	20	86	4	199	91	1	418	93	1	662	94	0
108	11	86	4	104	90	1	191	92	1	264	92	1
120	1			10	89	2	9	92	1	9	92	1

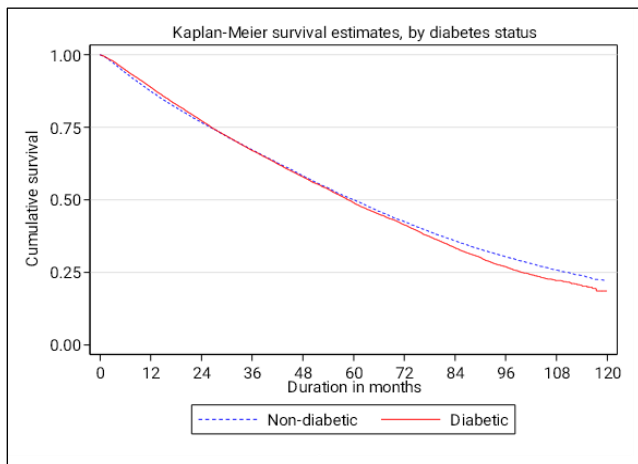
Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17700	100		25301	100		23192	100	
6	15313	99	0	21751	99	0	19373	100	0
12	13397	99	0	18889	99	0	16343	99	0
24	10361	98	0	14338	98	0	11557	98	0
36	8084	97	0	10620	97	0	8004	98	0
48	6073	97	0	7595	96	0	5268	97	0
60	4375	96	0	5234	96	0	3217	97	0
72	3005	95	0	3421	95	0	1886	96	0
84	1910	95	0	1990	95	0	1016	96	0
96	1046	94	0	1038	94	0	487	96	0
108	434	94	0	396	93	0	156	95	0
120	19	93	1	6	93	1	9	95	0

Unadjusted technique survival in non-diabetics at 1, 5 and 10 years was 87%, 50% and 22% respectively. Unadjusted technique survival for diabetics was worse than non-diabetics; 89% at 1 year, 49% at 5 years and only 19% at 10 years. There was no apparent difference in the unadjusted technique survival by diabetes status when censored for death & transplant.

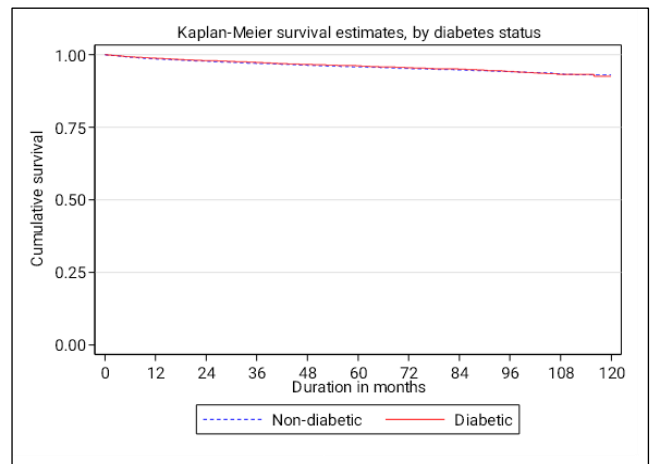
**Table 8.3.3(a): Unadjusted technique survival by diabetes status, 2014-2023**

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	59138	100		22653	100	
6	49843	94	0	20024	95	0
12	42766	87	0	17713	89	0
24	31886	77	0	13688	77	0
36	23616	67	0	10510	67	0
48	17281	58	0	7456	58	0
60	12155	50	0	4951	49	0
72	8098	42	0	3284	41	0
84	5102	36	0	1967	33	0
96	2826	30	0	1022	27	1
108	1171	26	0	378	22	1
120	14	22	1	18	19	1

**Figure 8.3.3(a): Unadjusted technique survival by diabetes status, 2014-2023**



**Figure 8.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2014-2023**



**Table 8.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2014-2023**

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	59138	100		22653	100	
6	49778	99	0	20089	99	0
12	42743	99	0	17736	99	0
24	31799	98	0	13775	98	0
36	23517	97	0	10609	97	0
48	17195	96	0	7542	97	0
60	12104	96	0	5002	96	0
72	8116	95	0	3266	96	0
84	5120	95	0	1949	95	0
96	2824	94	0	1015	94	0
108	1132	93	0	417	93	1
120	12	93	0	20	93	1