
15TH REPORT
OF THE MALAYSIAN
DIALYSIS & TRANSPLANT REGISTRY
2007

Sponsors :
Malaysian Society of Nephrology
Association of Dialysis Medical Assistants and Nurses

The National Renal Registry is funded with grants from :
The Ministry of Health Malaysia
Ain Medicare
Baxter Healthcare
Fresenius Medical Care
Roche

August 2008

© National Renal Registry, Malaysia

ISSN 1675-8862

Published by:

The National Renal Registry

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This report is also published electronically on the website of the National Renal Registry at:

<http://www.msn.org.my/nrr>

ACKNOWLEDGEMENTS

The National Renal Registry would like to thank the following :

**All the nephrologists and staff of the dialysis and transplant follow-up centres
for their hard work and participation,**

The Ministry of Health, Malaysia for support seen and unseen,

Our industry sponsors for their generous support :-

Ain Medicare

Baxter Healthcare

Fresenius Medical Care

Roche

**The staff of the Clinical Research Centre particularly Lim Jie Ying,
Hoo Lin Ping and Azizah Alimat**

Members of the National Transplant Registry who have kindly contributed to this Report

&

All who have in one way or another supported the National Renal Registry

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2008 - 2010

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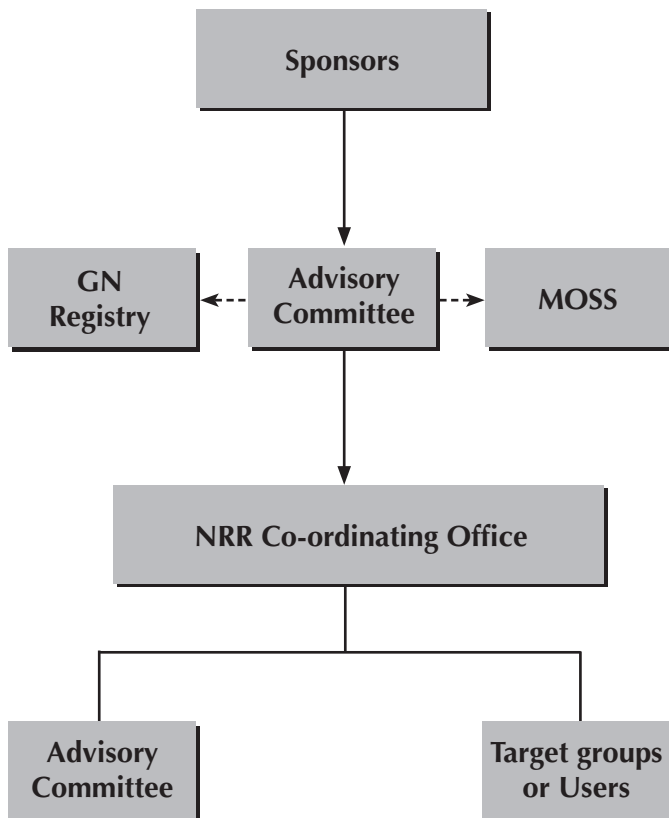
ABOUT THE NATIONAL RENAL REGISTRY

The National Renal Registry (NRR) has its origin in the Dialysis and Transplant Registry established by the Department of Nephrology in 1992. Its ownership was subsequently transferred to the Malaysian Society of Nephrology in 1995. The sponsors of NRR are the Malaysian Society of Nephrology (MSN) and the Association of Dialysis Medical Assistants and Nurses (ADMAN).

The objectives of the NRR are to :

1. Determine the disease burden attributable to End Stage Renal Disease (ESRD), and its geographic and temporal trends in Malaysia.
2. Determine the outcomes, and factors influencing outcomes of Renal Replacement Therapy (RRT).
3. Evaluate the RRT program.
4. Stimulate and facilitate research on RRT and ESRD.
5. Maintain the national renal transplant waiting list.

The NRR organization is as follows :



Owner

The Malaysian Society of Nephrology

Sponsors

The Malaysian Society of Nephrology is the sponsor of the National Renal Registry and the Malaysian Organ Sharing System (MOSS). The Association of Dialysis Medical Assistants and Nurses (ADMAN) has been invited to be the co-sponsor.

Advisory Committee

This is the committee established by the sponsors to oversee the operations of the registry and MOSS. Interested parties including source data producers, Renal Registry Unit and target groups or users are represented on this committee.

National Renal Registry Office

The NRR office is the coordinating center that collects and analyses the data. It publishes the annual report of Malaysian Dialysis & Transplant Registry and the Directory of Dialysis Centres in Malaysia. The Clinical Registry Manager (CRM) oversees the daily operation of the NRR. The Clinical Research Centre of Hospital Kuala Lumpur provides the epidemiological, statistical and information technological support to NRR.

Source Data Producers

These are the dialysis centres that collect the required data. It is the most critical and yet difficult element of the system. It has to be systematic and uniform, and producers of source data need to be trained and motivated to ensure high data quality.

Users or Target groups

These are the individuals or institutions to whom the regular registry reports are addressed. It is their need for information to assist in the planning and implementing disease treatment, control and prevention activity that justify the investment in the registry. They include:

1. the renal community
2. the RRT provider
3. the public health practitioner
4. the decision maker in various government and non-government agencies who have responsibilities for any aspects of ESRD treatment, prevention and control
5. the researcher with an interest in ESRD and RRT.
6. the press and the public.

ABOUT MOSS

Malaysian Organ Sharing System or MOSS was started in 1997. In 2006, it was upgraded to a web application named e-MOSS and was officially launched by Y. B. Dato Dr. Hj. Abd Latiff B Ahmad, the Deputy Minister of Health, Malaysia on 1st September 2006.

MOSS is managed by the MOSS sub-committee of the MOSS/NRR committee established under the Malaysian Society of Nephrology (MSN).

The objectives of e-MOSS

1. To maintain a list of patients who have voluntarily enrolled as potential recipients in the cadaveric kidney transplantation program in Malaysia.
2. To prioritise the waiting list according to an agreed criteria and its scoring system.
3. To update the waiting lists according to the specified criteria.
4. To enable cadaver organs to be allocated in a fair and equitable manner.
5. To facilitate centres to effectively manage their patients on the transplant waiting list

The functions of the MOSS sub-committee are :

1. Make operational decisions concerning MOSS.
2. Secure views of nephrologists and other clinical staff regarding its policies and operations.
3. Identify nephrologists to assist in the potential recipient management.

The role of e-MOSS :

All patients registered with NRR will be included in the e-MOSS. However, the subsequent management of the patients' lists depends on the participating centres.

1. The doctor caring for dialysis patients who are potential recipients can now effectively maintain their patients on the lists and update their patients' treatment information regularly.
2. The transplant coordinating centres can now access the potential recipients' listing that is ranked according to the pre-determined criteria. The patient could be easily contactable in the event of organ donation.

Participation in e-MOSS :

This system is located in a secured site; <https://www.macr.org.my/emoss>. There are links provided from <http://msn.org.my> or <http://msn.org.my/nrr>. All dialysis centres are welcome to be an e-MOSS user.

How to register with e-MOSS?

1. The dialysis centre needs to register as an e-MOSS user. Registration instruction and its documents are available in the web application.
2. Registered centre can nominate more users. However, the authorization must be from the centre's doctor in-charge.
3. All e-MOSS users need to complete a user agreement form and submit it to NRR for processing.

Management of e-MOSS :

All patients registered with NRR shall be listed in the e-MOSS on the following day according to the criteria set in the e-MOSS. These are the listing where patients will be grouped:

1. SOS List
2. On Wait List
3. Auto Off List (Pending data update)
4. Temporary Off List
5. Pending Evaluation
6. Ineligible for transplant
7. Death and Transplanted

1. SOS List :

Patients on this list are given special priority as they are expected to have lifespan of less than a year unless renal transplantations are performed. Only nephrologists can request placement of patients into this list and patient will only be placed into this list after approval is obtained from the MOSS Committee.

2. On Wait List

Patients listed here are patients who have met the criteria. These are the potential cadaver organ recipients.

3. Auto Off List (Pending data update)

If the participating centre did not submit the Annual Return (Haemodialysis & Peritoneal Dialysis) of a patient who is in the 'On Wait List', the system will automatically placed the patient into this list. The patient in this list will not be eligible for organ transplantation.

The patient will be placed back into the "On wait list" subsequently if the serology results have been updated and the patient will not be penalized.

4. Temporary Off List

Doctor in charge should place the patient who is temporarily unfit for a transplant into this list so that he/she will not be contacted in the event of organ donation.

Transplant nephrologists will place the patient who is temporarily unfit for a transplant into this list if he/she is not fit for a transplant when contacted during the organ donation event.

5. Pending Evaluation

The potential eligible patients will be listed in the 'Pending List' upon registration with NRR. The doctor in-charge needs to assess the suitability of the patients for a transplant to enable the patient to be listed in the Wait list.

6. Ineligible for transplant

System auto list those patients who do not meet e-MOSS criteria.

7. Death and Transplanted

These are patients who had a transplant and the graft is still functioning and those patients who had passed away.

PARTICIPATING HAEMODIALYSIS CENTRES 2007

JOHOR

1. Amitabha Haemodialysis Centre Johor Bahru, HD Unit
2. Batu Pahat Hospital, HD Unit
3. Batu Pahat Rotary, HD Unit
4. BP Renal Care (Rengit), HD Unit
5. BP Renal Care (Kluang), HD Unit
6. BP Renal Care (Segamat), HD Unit
7. BP Renal Care, HD Unit
8. BP Renalcare (Batu Pahat), HD Unit
9. Che Eng Khor Centre, HD Unit
10. Hospital Pakar Sultanah Fatimah Muar, HD Unit
11. JB Lions MAA-Medicare Charity Dialysis Centre (1), HD Unit
12. JB Lions MAA-Medicare Charity Dialysis Centre (2), HD Unit
13. JJ Lions Dialysis Centre, HD Unit
14. Johor Specialist Hospital, HD Unit
15. Kluang Hospital, HD Unit
16. Kota Tinggi Hospital, HD Unit
17. Mersing Hospital, HD Unit
18. Mersing Rotary Centre, HD Unit
19. Muar Dialysis, HD Unit
20. Muar Lions Renal Centre, HD Unit
21. Persatuan Membaiki Akhlak-Che Luan Khor_NKF, HD Unit
22. Pertubuhan Hemodialisis Muhibbah Segamat (Labis), HD Unit
23. Pertubuhan Hemodialisis Muhibbah, HD Unit
24. Pontian Hospital, HD Unit
25. Pontian Rotary Haemodialysis Centre, HD Unit
26. Premier Renal Care, HD Unit
27. Prima Dialysis Kluang, HD Unit
28. Pusat Dialisis & Kesihatan Masjid Bandar Baru Uda, HD Unit
29. Pusat Dialisis Nefro Utama (Johor Bahru), HD Unit
30. Pusat Dialisis Nefro Utama (Kota Tinggi), HD Unit
31. Pusat Dialisis Nefro Utama (Pontian), HD Unit
32. Pusat Dialisis Perbadanan Islam (Pontian), HD Unit
33. Pusat Dialisis Waqaf An-nur (Batu Pahat), HD Unit
34. Pusat Dialisis Waqaf An-nur (Kota Raya), HD Unit
35. Pusat Dialisis Waqaf An-nur (Pasir Gudang), HD Unit
36. Pusat Dialysis Makmur, HD Unit
37. Pusat Haemodialisis Suria (Tangkak), HD Unit
38. Pusat Haemodialysis Amal Lexin
39. Pusat Hemodialisis Darul Takzim, HD Unit
40. Pusat Hemodialisis Hidayah, HD Unit
41. Pusat Hemodialisis Rotary Kota Tinggi, HD Unit
42. Pusat Hemodialisis Rotary Kulai, HD Unit
43. Pusat Perubatan Perbadanan Islam (Segamat), HD Unit
44. Puteri Specialist Hospital, HD Unit
45. Segamat Hospital, HD Unit
46. Sultan Ismail Hospital (Paed), HD Unit
47. Sultan Ismail Hospital, HD Unit
48. Sultanah Aminah Hospital, HD Unit
49. Systemic Dialysis Centre, HD Unit
50. Tangkak Hospital, HD Unit
51. Tangkak Lions Renal Centre
52. Temenggong Seri Maharaja Tun Ibrahim Hospital, HD Unit
53. The Rotary HD Centre (Johor Bahru), HD Unit
54. Yayasan Pembangunan Keluarga Johor-NKF, HD Unit
55. Yayasan Rotary Kluang, HD Unit
56. Zhi En Dialysis Centre, HD Unit

KEDAH

57. 807 Rumah Sakit Angkatan Tentera (Sg. Petani), HD Unit
58. Baling Hospital, HD Unit
59. Buddhist Tzu Chi (Jitra), HD Unit
60. Kuala Nerang Hospital, HD Unit
61. Kulim Haemodialysis (CS Tan), HD Unit
62. Kulim Hospital, HD Unit
63. Langkawi Hospital, HD Unit
64. Metro Specialist Hospital, HD Unit
65. Pertubuhan Bakti Fo En Bandar Kulim, HD Unit
66. Pusat Dialisis K K Tan (Kulim), HD Unit
67. Pusat Dialysis K K Tan (Sg Petani), HD Unit
68. Pusat Haemodialisis Dr. Ismail, HD Unit
69. Pusat Hemodialisis Beng Siew, HD Unit
70. Pusat Hemodialisis Mergong, HD Unit
71. Pusat Hemodialisis S P, HD Unit
72. Pusat Kesihatan Jitra, HD Unit
73. Pusat Rawatan Hemodialisis Yayasan Emkay & Sultanah Bahiyah, HD Unit
74. Putra Medical Centre, HD Unit
75. Rawatan Dialisis Amal Lion_NKF, HD Unit
76. Renal Care (Kedah), HD Unit
77. Renal Medicare, HD Unit
78. Sik Hospital, HD Unit
79. Sultan Abdul Halim Hospital, HD Unit
80. Sultanah Bahiyah Hospital, HD Unit
81. Superkids Trinity-NKF Dialysis Centre, HD Unit
82. Yan Hospital, HD Unit

KELANTAN

83. Gua Musang Hospital, HD Unit
84. KB Rotary-MAA Charity Dialysis, HD Unit
85. Kuala Krai Hospital, HD Unit
86. Machang Hospital, HD Unit
87. Pakar Perdana Hospital, HD Unit
88. Pasir Mas Hospital, HD Unit
89. Pusat Dialisis Yayasan Buah Pinggang Kebangsaan (Kota Bharu), HD Unit
90. Pusat Perubatan Tentera (Kota Bharu), HD Unit
91. Pusat Rawatan Dialisis Islah (Kota Bharu), HD Unit
92. Raja Perempuan Zainab II Hospital, HD Unit
93. Renal-Link (Kelantan), HD Unit
94. Tanah Merah Hospital, HD Unit
95. Tengku Anis Hospital, HD Unit
96. Tumpat Hospital, HD Unit
97. USM Hospital, HD Unit

PARTICIPATING HAEMODIALYSIS CENTRES 2007 (cont.)

MELAKA

98. 94 Hospital Angkatan Tentera (Terendak), HD Unit
99. Alor Gajah Dialysis Centre, HD Unit
100. Alor Gajah Hospital, HD Unit
101. Amitabha Centre (Melaka), HD Unit
102. Damai Medical & Heart Clinic, HD Unit
103. Mahkota Medical Centre, HD Unit
104. Melaka Hospital, HD Unit
105. Pantai Air Keroh Hospital, HD Unit
106. Pusat Dialisis Giat Kurnia (Masjid Tanah), HD Unit
107. Pusat Dialisis Comfort, HD Unit
108. Pusat HD SJAM Bacang Melaka, HD Unit
109. Pusat Hemodialisis SJAM Pulau Sebang, HD Unit
110. Pusat Hemodialisis Suria (Jasin), HD Unit
111. Sinar Hemodialisis, HD Unit
112. Tenang Haemodialysis Centre, HD Unit
113. Tenang Haemodialysis Jasin, HD Unit
114. Yakin Jaya, HD Unit
115. Yayasan Kebajikan The Southern Melaka, HD Unit

NEGERI SEMBILAN

116. Haemodialysis Mawar Gemas, HD Unit
117. Jelebu Hospital, HD Unit
118. Persada Dialysis Centre, HD Unit
119. Port Dickson Hospital, HD Unit
120. Pusat Dialisis Suria (Tampin), HD Unit
121. Pusat Hemodialisis Berkat Seroja, HD Unit
122. Pusat Hemodialisis Mawar N. Sembilan (Bahau), HD Unit
123. Pusat Hemodialisis Mawar N. Sembilan (Lukut), HD Unit
124. Pusat Hemodialisis Mawar N. Sembilan (Rantau), HD Unit
125. Pusat Hemodialisis Mawar N. Sembilan (Seremban), HD Unit
126. Pusat Pakar Dialisis Traktif (Kuala Pilah), HD Unit
127. Pusat Waqaf An-nur (Senawang), HD Unit
128. Seremban Specialist Hospital, HD Unit
129. Tampin Hospital, HD Unit
130. Tuanku Ampuan Najihah Hospital, HD Unit
131. Tuanku Jaafar Hospital (Paed), HD Unit
132. Tuanku Jaafar Hospital, HD Unit

PAHANG

133. Bentong Hospital, HD Unit
134. Jengka Hospital, HD Unit
135. Jerantut Hospital, HD Unit
136. Kuala Lipis Hospital, HD Unit
137. Kuantan Clinical Diagnostic Centre, HD Unit
138. MAA-Medicare Charity (Mentakab), HD Unit
139. Mentakab Haemodialysis Unit, HD Unit
140. Muadzam Shah Hospital, HD Unit
141. Pahang Buddhist Association, HD Unit
142. Pekan Hospital, HD Unit
143. Pusat Hemodialisis Islam Makmur, HD Unit
144. Raub Hospital, HD Unit
145. SJAM-KPS Haemodialysis Centre 9 (Raub), HD Unit

146. Sultan Haji Ahmad Shah Hospital, HD Unit
147. Tengku Ampuan Afzan Hospital (Paed), HD Unit
148. Tengku Ampuan Afzan Hospital, HD Unit

PERAK

149. 96 Hospital Angkatan Tentera (Lumut), HD Unit
150. Batu Gajah Hospital, HD Unit
151. Berchaam Dialysis Centre, HD Unit
152. Changkat Melintang Hospital, HD Unit
153. Emnur Teguh, HD Unit
154. Gerik Hospital, HD Unit
155. Hope Haemodialysis Society Ipoh, HD Unit
156. Ipoh Hospital, HD Unit
157. Ipoh Hospital, Home Unit
158. Kampar Hospital, HD Unit
159. Kuala Kangsar Hospital, HD Unit
160. MAA-Medicare Charity (Teluk Intan), HD Unit
161. Parit Buntar Hospital, HD Unit
162. Perak Community Specialist Hospital, HD Unit
163. Persatuan Amal Chin Malaysia Barat, HD Unit
164. Pertubuhan Perkhidmatan Haemodialisis Ar-Ridzuan, HD Unit
165. Pertubuhan Perkhidmatan Hemodialisis AIXIN Kerian, HD Unit
166. PMA Chan Meng Khor-MAA Medicare Charity Dialysis Centre
167. Pulau Pangkor Hospital, HD Unit
168. Pusat Dialisis Darul Iltizam Taiping, HD Unit
169. Pusat Dialisis Ehsan Perak (Parit Buntar), HD Unit
170. Pusat Dialisis Intan, HD Unit
171. Pusat Dialisis Kuala Kangsar, HD Unit
172. Pusat Dialisis LZS (Kapar), HD Unit
173. Pusat Dialisis Mutiara, HD Unit
174. Pusat Dialisis Penawar Permai, HD Unit
175. Pusat Dialisis Setia (Ipoh)
176. Pusat Dialisis Taiping (Kamunting), HD Unit
177. Pusat Dialisis Taiping (Kuala Kangsar), HD Unit
178. Pusat Dialisis Taiping (Parit Buntar), HD Unit
179. Pusat Dialisis Taiping, HD Unit
180. Pusat Dialisis Setia, HD Unit
181. Pusat Hemodialisis Darul Iltizam (Ipoh), HD Unit
182. Pusat Hemodialisis Darul Iltizam Tapah, HD Unit
183. Pusat Hemodialisis Kampar, Yayasan Nanyang, HD Unit
184. Pusat Hemodialisis Manjung, HD Unit
185. Pusat Rawatan Dialisis Wan Nong, HD Unit
186. Renal Care (Ipoh Specialist), HD Unit
187. Selama Hospital, HD Unit
188. Seri Manjung Hospital, HD Unit
189. Sg Siput Hospital, HD Unit
190. Slim River Hospital (Tanjong Malim), HD Unit
191. Taiping Hospital, HD Unit
192. Tapah Hospital, HD Unit
193. Teluk Intan Hospital, HD Unit
194. Woh Peng Cheang Seah, HD Unit
195. Yayasan Akhlak-NKF Taiping, HD Unit
196. Yayasan Dialysis Pendidikan Akhlak Perak-NKF Ipoh, HD Unit

≡≡≡ PARTICIPATING HAEMODIALYSIS CENTRES 2007 (cont.) ≡≡≡

PERLIS

- 197. Tuanku Fauziah Hospital, HD Unit
- 198. Tuanku Syed Putra Haemodialysis Centre, HD Unit

PENANG

- 199. AMD Rotary (Penang), HD Unit
- 200. Asia Renal Care (Penang), HD Unit
- 201. Balik Pulau Hospital, HD Unit
- 202. Buddhist Tzu Chi Dialysis Centre (Butterworth), HD Unit
- 203. Buddhist Tzu Chi HD Centre (Penang), HD Unit
- 204. Bukit Mertajam Hospital, HD Unit
- 205. Bukit Mertajam Specialist Hospital, HD Unit
- 206. Fo Yi NKF Dialysis Centre, HD Unit
- 207. Fo Yi NKF Dialysis Centre (2)
- 208. Gleneagles Medical Centre, HD Unit
- 209. Island Hospital, HD Unit
- 210. K K Tan Specialist (BM), HD Unit
- 211. Kepala Batas Hospital, HD Unit
- 212. Lam Wah Ee Hospital, HD Unit
- 213. Loh Guan Lye Specialist Centre, HD Unit
- 214. MAA-Medicare Charity (Butterworth), HD Unit
- 215. NEPH Sdn Bhd, HD Unit
- 216. Pantai Mutiara Hospital, HD Unit
- 217. Penang Adventist Hospital, HD Unit
- 218. Penang Caring Dialysis Society, HD Unit
- 219. Pertubuhan Dialisis Rotary-Satu Hati, HD Unit
- 220. Pertubuhan Hemodialisis SPS, HD Unit
- 221. Province Wellesley Renal Medifund, HD Unit
- 222. Pulau Pinang Hospital (Home), HD Unit
- 223. Pulau Pinang Hospital (Paed), HD Unit
- 224. Pulau Pinang Hospital, HD Unit
- 225. Pusat Dialisis Ehsan Perak (Pedar), HD Unit
- 226. Pusat Haemodialisis Zakat (Jawi), HD Unit
- 227. Pusat Haemodialisis St Anne BM, HD Unit
- 228. Pusat Hemodialisis Zakat (Balik Pulau), HD Unit
- 229. Pusat Hemodialisis Zakat (Bukit Mertajam), HD Unit
- 230. Pusat Hemodialisis Zakat (Butterworth), HD Unit
- 231. PWRM (BM) Dialysis Centre, HD Unit
- 232. Renal Link (Penang), HD Unit
- 233. Seberang Jaya Hospital (Butterworth), HD Unit
- 234. Seberang Perai (Bagan), HD Unit
- 235. SJ Dialysis Centre, HD Unit
- 236. Sungai Bakap, HD Unit
- 237. The Penang Community HD Society, HD Unit
- 238. TSC Renal Care, HD Unit

SABAH

- 239. Beaufort Hospital, HD Unit
- 240. Beluran Hospital, HD Unit
- 241. Duchess of Kent Hospital, HD Unit
- 242. Keningau Hospital, HD Unit
- 243. Kota Belud Hospital, HD Unit
- 244. Kota Kinabatangan Hospital, HD Unit

- 245. Kota Marudu Hospital, HD Unit
- 246. Kudat Hospital, HD Unit
- 247. Labuan Hospital, HD Unit
- 248. Lahad Datu Hospital, HD Unit
- 249. Likas Hospital, HD Unit
- 250. MAA-Medicare Charity (Kota Kinabalu), HD Unit
- 251. Nobel Dialysis Centre, HD Unit
- 252. Papar Hospital, HD Unit
- 253. Persatuan Buah Pinggang Sabah, HD Unit
- 254. Persatuan Hemodialisis Kinabalu Sabah, HD Unit
- 255. Queen Elizabeth Hospital, HD Unit
- 256. Ranau Hospital, HD Unit
- 257. Rotary Tawau Tanjung, HD Unit
- 258. Sabah Medical Centre, HD Unit
- 259. Sandakan Kidney Society, HD Unit
- 260. Semporna Hospital, HD Unit
- 261. Sipitang Hospital, HD Unit
- 262. Tambunan Hospital, HD Unit
- 263. Tawau Hospital, HD Unit
- 264. Tenom Hospital, HD Unit

SARAWAK

- 265. 801 Rumah Sakit Angkatan Tentera (Kuching), HD Unit
- 266. Bau Hospital, HD Unit
- 267. Betong Hospital, HD Unit
- 268. Bintulu Hospital, HD Unit
- 269. CHKMUS-MAA Medicare Charity, HD Unit
- 270. Kanowit Hospital, HD Unit
- 271. Kapit Hospital, HD Unit
- 272. KAS-Rotary-NKF, HD Unit
- 273. Kuching Specialist Hospital, HD Unit
- 274. Lawas Hospital, HD Unit
- 275. Limbang Hospital, HD Unit
- 276. Lundu Hospital, HD Unit
- 277. Marudi Hospital, HD Unit
- 278. Miri Hospital, HD Unit
- 279. Miri Red Crescent Dialysis Centre, HD Unit
- 280. Mukah Hospital, HD Unit
- 281. Normah Medical Specialist Centre, HD Unit
- 282. Rejang Medical Centre, HD Unit
- 283. Saratok Hospital, HD Unit
- 284. Sarawak General Hospital, HD Unit
- 285. Sarikei Hospital, HD Unit
- 286. Serian Hospital, HD Unit
- 287. Sibu Hospital, HD Unit
- 288. Sibu Kidney Foundation, HD Unit
- 289. Simunjan Hospital, HD Unit
- 290. SJAM-KPS Haemodialysis Centre 8 (Sibu), HD Unit
- 291. SJAM-KPS Pusat Hemodialisis Centre 10, (Bintulu), HD Unit
- 292. Sri Aman Hospital, HD Unit
- 293. Timberland Medical Centre, HD Unit
- 294. 819 Rumah Sakit Angkatan Tentera, HD Unit

≡≡≡ PARTICIPATING HAEMODIALYSIS CENTRES 2007 (cont.) ≡≡≡

SELANGOR

295. Ampang Hospital, HD Unit
296. Ampang Puteri Specialist Hospital, HD Unit
297. Apex Club of Klang-NKF Charity Dialysis Centre, HD Unit
298. Assunta Hospital, HD Unit
299. Bakti-NKF Dialysis Centre, HD Unit
300. Bangi Dialysis Centre, HD Unit
301. Banting Hospital, HD Unit
302. Berjaya NKF Dialysis Centre, HD Unit
303. Caring Dialysis Centre (Tanjong Karang), HD Unit
304. Damansara Specialist Hospital, HD Unit
305. EAM Dialysis Centre, HD Unit
306. Haemodialysis Association Klang, HD Unit
307. Haemodialysis Edina, HD Unit
308. Healthcare Dialysis Centre, HD Unit
309. Hemodialisis Yayasan Veteran ATM, HD Unit
310. Kajang Dialysis Centre, HD Unit
311. Kajang Hospital, HD Unit
312. Kelana Jaya Medical Centre, HD Unit
313. Kuala Kubu Bharu Hospital, HD Unit
314. MAA-Medicare Charity (Kajang), HD Unit
315. Persatuan Dialisis Kurnia PJ, HD Unit
316. Persatuan Dialisis Touch, HD Unit
317. Ping Rong-NKF, HD Unit
318. PNSB Dialisis Centre, HD Unit
319. Pusat Dialisis Aiman (Shah Alam), HD Unit
320. Pusat Dialisis LZS (Sg. Besar), HD Unit
321. Pusat Dialisis LZS (Shah Alam), HD Unit
322. Pusat Dialisis Pakar Medi-Nefro, HD Unit
323. Pusat Dialisis Sijangkang, HD Unit
324. Pusat Dialysis Mesra (Kapar), HD Unit
325. Pusat Dialysis Mesra (Rahman Putra), HD Unit
326. Pusat Dialysis Mesra (Shah Alam), HD Unit
327. Pusat Dialysis Mesra KKB, HD Unit
328. Pusat Dialysis Putra Jaya (Semenyih), HD Unit
329. Pusat Hemodialisis Fasa, HD Unit
330. Pusat Hemodialisis Kau Ong Yah Ampang, HD Unit
331. Pusat Hemodialisis Majlis Perbandaran Kelang, HD Unit
332. Pusat Hemodialisis Mawar N. Sembilan (Sepang), HD Unit
333. Pusat Hemodialisis Mawar N. Sembilan (Seri Kembangan), HD Unit
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337. Pusat Rawatan Dialisis Traktif (Selayang), HD Unit
338. Pusat Rawatan Hemodialisis Felina, HD Unit
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340. Rawatan Dialysis Bukit Tinggi, HD Unit
341. Reddy Clinic
342. Renal Associates, HD Unit
343. S.P. Menon Dialysis Centre (Klang), HD Unit
344. S.P. Menon Dialysis Centre (Petaling Jaya), HD Unit
345. Selangor Medical Centre, HD Unit
346. Selayang Hospital (Paed), HD Unit
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348. Serdang Hospital, HD Unit
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358. Sungai Buloh Hospital, HD Unit
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361. Syukur Elit Sdn Bhd, HD Unit
362. Tanjung Karang Hospital, HD Unit
363. Tengku Ampuan Jemaah Hospital, HD Unit
364. Tengku Ampuan Rahimah Hospital, HD Unit
365. Universiti Kebangsaan Malaysia Bangi, HD Unit
366. Yayasan Kebajikan SSL Puchong, HD Unit
367. Yayasan Kebajikan SSL, HD Unit

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368. Besut Hospital, HD Unit
369. Dungun Hospital, HD Unit
370. Hulu Terengganu Hospital, HD Unit
371. Kemaman Hospital, HD Unit
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373. Pusat Dialisis Terengganu/NKF, HD Unit
374. Pusat Hemodialisis Nabilah, HD Unit
375. Pusat Rawatan Dialisis Islah (Kuala Terengganu), HD Unit
376. Sultanah Nur Zahirah Hospital, HD Unit
377. YKN Dialisis (Terengganu), HD Unit

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378. Aiman Dialysis Centre, HD Unit
379. Charis-NKF Dialysis Centre, HD Unit
380. Cheras Dialysis Centre, HD Unit
381. Kampong Baru Medical Centre, HD Unit
382. Kuala Lumpur Hospital (Home), HD Unit
383. Kuala Lumpur Hospital (Paed.), HD Unit
384. Kuala Lumpur Hospital (Unit 1), HD Unit
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387. Kuala Lumpur Lions Renal Centre, HD Unit
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390. MDZ Haemodialysis Centre, HD Unit
391. National Kidney Foundation Dialysis Centre (KL), HD Unit
392. Pantai Indah Hospital, HD Unit
393. Pantai Medical Centre (2), HD Unit
394. Pantai Medical Centre (KL), HD Unit
395. Poliklinik Komuniti Tanglin, HD Unit
396. Pusat Dialisis Falah, HD Unit
397. Pusat Dialisis Pusat Pungutan Zakat (Kuala Lumpur), HD Unit
398. Pusat Hemodialisis Dato' Lee Kok Chee, HD Unit
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400. Pusat Hemodialisis PUSRAWI, HD Unit
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402. Pusat Hemodialisis Yayasan Felda, HD Unit
403. Pusat Pakar Tawakal, HD Unit
404. Pusat Rawatan Dialisis Nefro Utama (Setapak), HD Unit
405. Renal Dialysis Centre, HD Unit
406. Rotary Damansara-NKF Dialysis, HD Unit
407. S.P. Menon Dialysis Centre (Kuala Lumpur), HD Unit
408. Smartcare Dialysis Clinic, HD Unit
409. The Kidney Dialysis Centre 1, HD Unit
410. The Kidney Dialysis Centre 2, HD Unit
411. The Nayang-NKF Dialysis Centre, HD Unit
412. Traktif Specialist Dialysis Centre (Wangsa Maju), HD Unit
413. Tung Shin Hospital & Yayasan Nanyang Press, HD Unit
414. Tung Shin Hospital, HD Unit
415. UKM Hospital, HD Unit
416. University Malaya Medical Centre, HD Unit
417. University Malaya Specialist Centre, HD Unit
418. YKN Dialisis (Kuala Lumpur), HD Unit

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JOHOR

BP Renal Care, CAPD Unit
BP Renal Care, Segamat, CAPD Unit
Sultan Ismail Hospital (Paed), CAPD Unit
Sultanah Aminah Hospital, CAPD Unit

KEDAH

Sultanah Bahiyah Hospital, CAPD Unit
Raja Perempuan Zainab II Hospital, CAPD Unit
USM Hospital, CAPD Unit

MELAKA

Damai Medical & Heart Clinic, CAPD Unit
Melaka Hospital, CAPD Unit

NEGERI SEMBILAN

Tuanku Jaafar Hospital (Paed), CAPD Unit
Tuanku Jaafar Hospital, CAPD Unit

PAHANG

Tengku Ampuan Afzan Hospital (Paed), CAPD Unit
Tengku Ampuan Afzan Hospital, CAPD Unit

PERAK

96 Hospital Angkatan Tentera (Lumut), CAPD Unit
Ipoh Hospital, CAPD Unit
Renal Care (Ipoh Specialist), CAPD Unit

PENANG

Pulau Pinang Hospital (Paed), CAPD Unit
Pulau Pinang Hospital, CAPD Unit

SABAH

Queen Elizabeth Hospital, CAPD Unit
Sabah Medical Centre, CAPD Unit

SARAWAK

Sarawak General Hospital, CAPD Unit

SELANGOR

Selayang Hospital (Paed), CAPD Unit
Selayang Hospital, CAPD Unit
Serdang Hospital, CAPD Unit
Sri Kota Medical Centre, CAPD Unit
Tengku Ampuan Rahimah Hospital, CAPD Unit

TERENGGANU

Sultanah Nur Zahirah Hospital, CAPD Unit

WILAYAH PERSEKUTUAN KUALA LUMPUR

Kuala Lumpur Hospital (Paed.), CAPD Unit
Kuala Lumpur Hospital, CAPD Unit
UKM Hospital, CAPD Unit
University Malaya Medical Centre, CAPD Unit

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JOHOR

Batu Pahat Hospital, Tx Unit
Hospital Sultan Ismail Pandan (Paed), Tx Unit
Pakar Sultanah Fatimah Muar Hospital, Tx Unit
Pontian Hospital, Tx Unit
Segamat Hospital, Tx Unit
Hospital Sultan Ismail Pandan, Tx Unit
Kluang Hospital, Tx Unit
Sultanah Aminah Hospital, Tx Unit

KEDAH

Alor Setar Hospital, Tx Unit

KELANTAN

Kota Bharu Hospital, Tx Unit
MAA-Medicare Charity Dialysis (KB Rotary), Tx Unit
USM Hospital, Tx Unit

MELAKA

Damai Medical & Heart Clinic, Tx Unit
Mahkota Medical Centre, Tx Unit
Melaka Hospital, Tx Unit

NEGERI SEMBILAN

Hospital Tuanku Ja'afar Seremban, Tx Unit

PAHANG

Tg. Ampuan Afzan Hospital, Tx Unit

PERAK

Ipoh Hospital, Tx Unit
Taiping Hospital, Tx Unit

PENANG

Pulau Pinang Hospital, Tx Unit

SABAH

Duchess of Kent Hospital, Tx Unit
Likas Hospital, Tx Unit
Queen Elizabeth Hospital, Tx Unit
Sabah Medical Centre, Tx Unit
Tawau Hospital, Tx Unit

SARAWAK

Bintulu Hospital Tx Unit
Miri Hospital, Tx Unit
Sarawak General Hospital, Tx Unit
Sibu Hospital, Tx Unit
Timberland Medical Centre, Tx Unit

SELANGOR

Amfang Puteri Specialist Hospital, Tx Unit
Selayang Hospital, Tx Unit
Serdang Hospital, Tx Unit
Sri Kota Medical Centre, Tx Unit
Sunway Medical Centre, Tx Unit
Tan Medical Renal Clinic, Tx Unit
Tg. Ampuan Rahimah Hospital, Tx Unit

TERENGGANU

Kemaman Hospital, Tx Unit
Kuala Terengganu Hospital, Tx Unit

WILAYAH PERSEKUTUAN KUALA LUMPUR

Kuala Lumpur Hospital (Paed), Tx Unit
Kuala Lumpur Hospital, Tx Unit
Renal Dialysis Centre, Tx Unit
Smartcare Dialysis Centre (Cheras), Tx Unit
UKM Hospital, Tx Unit
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FOREWORD

The planning of facilities for Renal Replacement Therapy (RRT) in a developing country like Malaysia was relatively easy in the last 10-20 years. This was because the demand for RRT was high and resources, particularly financial, were limited. There was no danger of building excess capacity. Every single space in a new facility particularly in the public sector was used.

A figure of 100 per million new cases of End Stage Renal Disease (ESRD) per year was used for planning and management purposes so assiduously that it was frequently quoted in the newspapers, by politicians and by ministry of health officials. All sectors, the government, the non-profit organizations and the private healthcare providers worked towards providing more places for Hemodialysis (HD) treatment.

Quietly, without much fanfare or any display of pride that “we have made it!”, the country reached the magic figure of 100 per million in 2003 and moved on to the present rate of 130 per million. Even more impressive was the fact that in 2007, eight of the fourteen states accepted more than 130 new patients per million with four of these states accepting more than 190 per million.

We have indeed come a long way. No other country with our level of national income has come close to these figures. We (all stakeholders in this dialysis provision) deserve to be congratulated. Success, however, calls for evaluation and reevaluation of strategies, if not for anything else, to achieve greater success.

A cursory look at the figures reveals that a state with the highest treatment rate accepted more than three times the number of patients per million population than the one with the lowest. This is continually being addressed and the situation has improved compared to a few years earlier. Another set of data showed that states with high treatment rates do not have optimal HD capacity to patient ratio indicating that there is now excess capacity. There are some dialysis centres running on one shift a day or on alternate days. Should we waste resources just because the public and the government continue to be generous to ESRD patients? Can some of these resources be diverted for other potentially beneficial initiatives like screening for kidney diseases and effective public education?

One other consideration is to use some of the resources to develop Peritoneal Dialysis (PD) treatment in the NGO hemodialysis centres. Presently long-term PD is available almost exclusively in public sector hospitals. Slightly over ten percent of patients on dialysis in 2007 were on PD. Some mechanism can be worked out where NGO centers can collaborate with public sector hospitals in offering patients PD as another choice of dialysis modality. Such collaboration can include having the Tenckhoff Catheter insertion and treatment for peritonitis to be done in public hospitals. The NGO centres can provide day care services like transfer set change and periodic review of patients by nephrologists.

PD should be considered even in states with low treatment rate. The development costs of setting up a Hemodialysis centre is increasing with the rising cost of construction materials and labour. The costs of CAPD (or Automated PD) may come down when the number of patients on this treatment increases.

This basic principle in economics, economy of scale, made us very successful with hemodialysis treatment. We now pay less for dialysers, needles, bloodlines and dialysates than we did 10-15 years ago. The other major reason for affordable hemodialysis was opening up the hemodialysis supplies market to as many players as possible without compromising quality.

Once again our gratitude goes to Ms Lee Day Guat and her team for their commitment and dedication in putting together this 15th report. We also thank the chapter editors, the report editors Drs Lim Yam Ngo and Lim Teck Onn and the staff of all participating centres for sending the data religiously every year. We hope that by studying our centre results, we will be able to further improve the patients’ survival and quality of life and reduce the variation across many centres.

Dr. Rozina Ghazalli
Chairperson

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Co - Chairperson

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REPORT SUMMARY

- Intake of new dialysis patients showed a linear increase from 1253 in 1998 to 3570 in 2006 with corresponding treatment rates of 56 and 134 per million population.
- Prevalent dialysis patients increased from 4570 (205 per million) in 1998 to almost 16000 (615 per million) at year end 2007.
- Transplant rates showed a decreasing trend over 2006 and 2007. Patients with functioning renal transplants increased very slightly from 1112 (50 per million) to 1726 (64 per million) over the same period.
- Pulau Pinang, Melaka, Johor and WP Kuala Lumpur have dialysis treatment rates around 200 per million. Terengganu with treatment rate of 164 per million has joined the developed states in 2007. Pahang and Sarawak have also shown rapid increase in dialysis treatment rates.
- From the centre survey carried out at the end of 2007, there were a total of 17367 dialysis patients, 35.7% in government centres, 30.1% in non-governmental organizations (NGO) centres and 34.8% in private sector. Almost all patients in NGO and private centres were on centre HD. In MOH, 25% were on chronic PD. The private sector had the largest number of dialysis centres, the NGO centres had the largest HD capacity. Private and NGO dialysis centres provided about 80% of the total dialysis provision in states with high dialysis provision rates and less than 50% in states with low centre HD provision rates except for Sarawak and Kedah.
- The treatment gap between men and women has remained consistent over the years.
- Dialysis treatment rates for those >45 years of continued to increase.
- At least 85% of new patients were accepted into centre haemodialysis
- The government continued to fund about 54% of new dialysis treatment, NGO funding was 10% in 2006, and self funding 26%.
- The proportion of new ESRD patients due to diabetes mellitus was 57% in 2007.
- With a developing country level of gross national income (GNI) of USD 5,070 per capita, Malaysia has been able to achieve RRT provision commensurate to many developed countries.
- The proportion of household income to HD cost has declined.
- Inequality of dialysis treatment has declined across all sectors of providers of dialysis as treatment expanded. Public services have switched from favouring the well off to favouring the poor.
- The annual death rate for those on hemodialysis remained relatively unchanged while the annual death rate on CAPD showed a decreasing trend over the last 10 years.
- Cardiovascular disease and death at home remained the commonest causes of death in 2006 at 25 and 18% respectively; death due to sepsis decreased to 10%.
- The overall unadjusted 5 years and 10 years patient survival on dialysis were 57% and 35% respectively.
- There was wide centre variation with regards to HD patient survival at one year which was more apparent at 5 years. Adjusted patient survival varied widely between CAPD centres at 5-years but not at 1-year.
- There was wide variation in odds ratio of death by dialysis centre.
- After adjustment for multiple risk factors, diabetics, older patients, higher diastolic BP, high serum calcium and serum phosphate, and hepatitis B antigenaemia were associated with higher mortality. Higher serum albumin, KT/V, haemoglobin concentration, calcium phosphate product and presence of hepatitis C antibodies were associated with lower mortality.
- Median QoL index scores were satisfactory and HD patients achieved a lower score than CAPD patients. Diabetes mellitus and older age group are factors associated with lower median QoL index scores. Higher employment rate among HD and CAPD patients who started dialysis earlier may be confounded by these healthier individuals who survived longer.

- In 2007, 86% of HD and 74% of CAPD patients were on erythropoietin (EPO). Blood transfusion rate in dialysis patients was 15% in 2007. Use of parenteral iron has increased, with corresponding reduction in oral iron prescription. The median weekly EPO dose remained at 4000 units, in both HD and CAPD patients. Median haemoglobin level increased to 10.8g/L in 2007. Median serum ferritin level was about 500 ng/L and transferrin saturation 32%. Wide variations were seen in the use of EPO, blood transfusion rates, measures of iron stores and hemoglobin levels in HD and CAPD centres
- Serum albumin levels remained at mean and median of about 40g/L for HD and about 34 g/L in CAPD patients in 2007. There were wide variations in the proportion of patients with serum albumin of at least 40g/L in both HD and CAPD centres.
- Body mass index for HD patients has stabilized around 24, but was still increasing for patients on CAPD. There was some variation in proportion of patients with BMI ≥ 18.5 in both HD and PD centres.
- In 2007, there was better control of predialysis diastolic than systolic blood pressure in HD patients. Blood pressure (BP) control in CAPD patients improved slightly over the years. The variation noted among the various HD and PD centres in median systolic or diastolic BP was not wide but there was wide variation in the proportion of patients achieving BP of $<140/90$ mmHg. Blood pressure control in CAPD was much better than in haemodialysis patients
- Improving cholesterol levels were seen in HD patients and CAPD patients with lower levels seen in HD patients. Serum triglyceride levels did not show much change over the years and was lower in HD patients. There remained significant variation in lipid control between dialysis centres.
- In 2007 calcium carbonate remained the major phosphate binder in both HD and CAPD patients. The percentage of patients on calcitriol was increasing. More patients underwent parathyroidectomy. Serum calcium levels were lower in HD patients. Phosphate control was better in CAPD patients. The target of calcium phosphate product of less than $4.5 \text{ mmol}^2/\text{L}^2$ was achieved more by CAPD patients than HD. Mean iPTH levels was about 246 ng/ml in both HD and CAPD patients in 2007. There was wide variation in serum calcium, phosphate, calcium phosphate product and iPTH among both hemodialysis and CAPD centres.
- The prevalence of Hepatitis B infection has remained unchanged over the years at about 5%, and was similar between HD and CAPD patients. HCV prevalence in HD although high showed a declining trend to 11% in 2007 from 22% ten years earlier. The proportion of HCV infected patients varied widely between HD centers. Previous renal transplant and history of blood transfusion were associated with a significantly higher risk of HCV seroconversion. Completely assisted HD patients and diabetics had a significantly lower risk of acquiring HCV infection
- Haemodialysis practices: There was increased use of brachiocephalic fistulae, higher blood flow rates, increased usage of synthetic membranes, and almost universal use of bicarbonate buffer. Although the prescribed median KT/V was 1.6 in 2007, the delivered median KT/V was only 1.4. The percentage of patients with a delivered KT/V ≥ 1.2 was 79%. In 2007, the median urea reduction ratio was 71.9% and the percentage of patients with URR $\geq 65\%$ was 82%. There was wide variation in the proportion of patients with blood flow rates of >250 ml/min, prescribed KT/V of ≥ 1.3 and delivered KT/V of ≥ 1.2 but less variation in urea reduction ratio among HD centres. Technique survival was better in HD compared to PD, in the younger age groups and the non-diabetics but was not related to the year of starting dialysis.
- Chronic PD practices - In 2007, 86% of PD patients were on CAPD, 6% on DAPD and 8% on automated PD. For CAPD, 93% were on Baxter disconnect system. 90% were on 4 exchanges a day, 88% used a fill volume of 2 L. The median delivered weekly Kt/V was 2.1, 83% achieved target Kt/V of ≥ 1.7 with a 1.5-fold variation between the highest and the lowest performing centres. Increasing age, diabetes, peritonitis episodes, cardiovascular disease, low serum albumin, low BMI, abnormal lipid profile, blood haemoglobin less than 10g/dL and assisted PD were associated with an increased risk for change of modality. The commonest reason for PD drop-out was peritonitis, followed by membrane failure and patient preference.
- In 2007, median peritonitis rate improved to 40.9 patient-months per episode but varied between 12 and 106 patient-months/episode among centres. Gram positive and Gram negative organisms each accounted for 32% and 27% of peritonitis episodes.

Renal Transplantation

- There were 138 new renal transplant recipients in 2006 and only 86 in 2007. There were 1726 with functioning transplants at the end of 2007. Incident renal transplantation rate was 5-7 per million, and prevalent rates at about 65 per million population.
- Mean age of new transplant patients in 2007 was 37 years; 62% were male, 12% diabetic, 5% HbsAg positive and 11% anti-HCV positive at the time of transplantation.
- Commonest known primary renal disease was chronic glomerulonephritis followed by hypertension and diabetes mellitus.
- In 2007, commercial transplants from China constituted only 33% of all new renal transplantation, live donor transplantation 24% and contribution from local cadaveric transplants increased to 28%.
- 72% of renal transplant recipients were on cyclosporine, and 21% were on tacrolimus. Use of MMF increased to 54% and azathioprine decreased to 29%.
- 14% of the prevalent renal transplant recipients had diabetes mellitus before transplantation, another 7% developed diabetes mellitus post transplantation
- In 2007, 34(2%) of transplant recipients died and 36 (2%) lost their grafts. Infection, cardiovascular disease and cancer were the commonest causes of death. Renal allograft rejection accounted for 50-75% of graft losses for the last 10 years
- The overall transplant patient survival rate from 1994 to 2007 was 95%, 88% and 81% at 1 year, 5 years and 10 years respectively, while the overall graft survival rate was 92%, 79% and 64% respectively. Living donor transplantation had the best patient survival. Living donor and commercial cadaver grafts had the best graft survival rates.

Paediatric Renal Replacement Therapy

- Intake of new paediatric dialysis patients increased from 49 in 1998 to 95 in 2006 giving a dialysis acceptance rate of 4 per million age related population (pmarp) to 8 pmarp respectively.
- At the end of 2007 there were a total of 509 patients under 20 on dialysis giving a dialysis prevalence rate 45 pmarp.
- New renal transplant rate was 2 pmarp from 2005.
- The number of patients with functioning transplants in 2007 was 166 giving a prevalence rate of 15 pmarp.
- Dialysis treatment rates were higher in the economically advantaged states of Malaysia.
- The number of 0-4 year olds provided RRT remained very low.
- Chronic PD was the initial dialysis modality in about 50% of patients. Of this 7% were on automated PD.
- About 90% received dialysis in government centres.
- Glomerulonephritis (other than FSGS) accounted for 21% of ESRD, focal segmental glomerulosclerosis 8%, and SLE 7%. 47% of patients had unknown primary renal disease.
- Patient survival for HD was 95% at 1 year, 82% at 5 years. CAPD patient survival was 94% at 1 year and 79% at 5 years.
- In the last 5 years, live related transplantation and cadaveric transplantation each contributed to 38% of renal transplantations done. 23% were from commercial cadaveric transplantation done overseas.
- Transplant patient survival was 98% at 1 year and 94% at 5 years; graft survival was 91% at 1 year and 79% at 5 years.

ABBREVIATIONS

CAPD	Continuous Ambulatory Peritoneal Dialysis
CCPD/APD	Continuous cycling peritoneal dialysis/automated peritoneal dialysis
CRA	Clinical Registry Assistant
CRC	Clinical Research Centre
CRM	Clinical Registry Manager
ESRD	End Stage Renal Disease
GNI	Gross National Income
HD	Haemodialysis
MOH	Ministry of Health
MOSS	Malaysian Organ Sharing System
NRR	National Renal Registry
NGO	Non-governmental organization
PD	Peritoneal dialysis
pmp	per million population
pmarp	per million age related population
RRT	Renal replacement therapy
SDP	Source data producer
TX	Transplant