

**Counties Manukau  
District Health Board**

**Neurology and Stroke Services (Adult)  
Health Services Plan**

**February 2008**

## 1.0 Current Services

All specialist adult neurology services for the CMDHB population are provided by the Auckland District Health Board (ADHB) Neurology Service. This includes secondary and tertiary inpatient/outpatient assessment and treatment for neurological disorders affecting the central and peripheral nervous systems caused by infection, neoplasm, trauma, congenital diseases, psycho-emotional illness and the immune system. Neurology services are a highly specialised medical specialty managing conditions such as: Epilepsy, Alzheimer's disease, Peripheral neuropathy, Parkinson's disease, Motor Neuron disease, cerebral tumour, Cerebral Vascular Accident (CVA) and Muscular Dystrophy.

Neurosurgery is also provided for CMDHB residents through the Auckland Neurosurgical Service which benefits from the very close relationships between these two services.

### Services Provided at ADHB Facilities for CMDHB Residents

Neurology Services provided by ADHB include:

- Inpatient care and treatment Auckland City Hospital (ACH).
- Day case procedures, investigations and treatments (ACH).
- Consultation and opinions for patients in other specialties including those in Middlemore Hospital.
- Outpatient first and follow up specialist assessment clinics Greenlane Clinical Centre (GCC).
- Outpatient first and follow up specialist assessment clinics (Manukau SuperClinic).
- Electroencephalography (EEG) procedures conducted by a technician and interpreted by a neurologist. These tests are also performed on referral from General Medicine, Paediatrics and Mental Health services.
- EMG (Electromyography) and nerve conduction studies either on neurologist request or referrals from orthopaedic/hand surgeons.
- A Neurology nurse specialist manages patients with the chronic neurological disorders e.g. Multiple Sclerosis, Parkinsons) and provides support and education to patients with referral to a neurologist as necessary.

There is no acute neurology inpatient service provided at Middlemore Hospital with this service being provided at ACH. CMDHB Medical Services manage all acute stroke patients under the Stroke Team or General Medicine teams with thrombolytic treatment for cerebral thrombosis provided by CMDHB General Physicians.

An ADHB neurologist provides a weekly dedicated stroke session to CMDHB which includes a multi-disciplinary team meeting, stroke ward round, stroke-related education and research. Within the next 12 months this will be expanded up to 20 hours per week and will provide more neurologist input into the acute stroke ward.

There is no formal linkage currently with the CMDHB Geriatricians and the neurology service.

The ADHB Service provides services across the Auckland metropolitan region on a "hub and spoke" basis with a level of outpatient assessment and follow-up by ADHB Neurologists at local DHB's. Currently ADHB provides three half-day neurology consultation sessions to Manukau SuperClinic for triaged Priority 2 and 3 CMDHB patients. The ADHB Service also provides three half-days per week consult service to Middlemore Hospital inpatients. There is no patient education service provided to the residents of CMDHB currently by the Auckland DHB service.

Currently Thrombolysis is provided as a treatment during usual hours by a CMDHB General/Stroke Physician with assistance from the Neurology team from ADHB.

## Volume Data

Service level data is provided as an appendix to this workstream. Table 1 below shows a comparison of contract volumes for First Specialist Assessment (FSA) for the three Auckland metropolitan DHBs, Bay of Plenty DHB and a total of the non-Auckland metropolitan DHBs. The data is displayed in Table 1 where we see that the CMDHB population has a higher ratio of FSA per head of population of 380:1, compared to ADHB at 375:1 and WDHB 336:1.

Volumes for CMDHB are set on a combination of previous years' activities, waiting times and input any other information to hand at the time. CMDHB has a slightly higher ratio than ADHB and WDHB. A factor which may influence this is the relatively young CMDHB population (compared to WDHB which has an older demographic profile). We are also not clear to what extent physical distance for Priority 1 patients having to go to the GCC is a factor in access to the service. Current CMDHB strategy is to increase the number of clinics held on-site at the Manukau Campus.

**Table 1: Ratio of FSA to Population for the 2006 07 Fiscal Year: Neurology**

FSA		CMDHB	ADHB	WDHB	BOP	OTHER*
2006/07 Total		1219	1160	1522	520	9568
POPULATION		463760	435420	512670	200000	2815393
RATIO		380.44	375.36	336.84	384.62	294.25

\* Other refers to all non Auckland DHBs. i.e. includes BOP and NDHB

Data taken from 2006 07 Ministry of Health Personal Health Non Case Weight database.

## Inpatient Consultations

Currently inpatient consultation volume is approximately 52 referrals per month with General Medicine and Emergency Medicine the highest number of referrals to the consultation service. There is also Neurologist phone advice available outside of the three half days a neurologist is on site at Middlemore Hospital.

## Inpatient Discharges

There are no Neurology discharges from CMDHB using Health Specialty Codes definitions but General Physicians deal with many neurological patients as part of General Medicine (e.g. Epilepsy). CMDHB inpatients are managed by the ADHB service.

## Senior Medical Staffing Workforce

ADHB provides the following SMO workforce to services that are delivered at CMDHB facilities:

- 0.19 FTE senior medical staffing to provide outpatient clinics at MSC.
- 0.38 FTE senior medical staffing for inpatient consultation service Monday, Wednesday and Friday mornings.
- 0.15 FTE senior medical staffing for stroke team support (to be included in the position described below).

ADHB and CMDHB have agreed to pursue the joint appointment of a neurologist with 0.50 FTE in each DHB. This is based on a similar model that has been implemented between WDHB and ADHB and is working effectively. The 0.50FTE position at CMDHB will primarily run the Stroke ward based team, lead the stroke service, hold a weekly stroke clinic and strengthen the linkages back to the Neurology team at ADHB. The position will contribute to the ADHB neurology out of hours call and rotate through the various components of the neurology service at ADHB.

The Stroke Service is actively involved with research and audit and CMDHB anticipates this increasing with the joint Neurologist appointment. This appointment will also facilitate involvement in regional research and audits by strengthening the existing linkages to the ADHB team.

## **2.0 Key Issues**

### **Patient access to locally provided neurology services**

Currently the majority of services for the people of Counties Manukau are provided at ACH. This creates challenges associated with traveling for many CMDHB residents and is contrary to the intention of CMDHB to provide secondary care services locally.

### **Integration of local services associated with neurology**

Limited on-site provision of neurology services does not support the valued input of neurology services into stroke management and rehabilitation.

## **3.0 Trends and Future Direction**

There are a number of clinical and technological changes affecting the development of Neurology Services. These will be driven by the ADHB clinical team and are being addressed through the Regional Neurology Plan.

### **Impact of new diagnostics on neurological conditions**

While increasingly MRI will be used in making accurate diagnosis of Alzheimer's Disease, CT and PET scanning will increasingly prove valuable in diagnosis of neurological conditions. CMDHB now has good access to both MRI and CT and anticipates approval of a national PET service in the near future.

### **Introduction of new techniques and pharmaceuticals for the management of neurological conditions**

Significant disability is often associated with neurological conditions and the development of new pharmaceuticals and techniques (e.g. deep brain stimulation for the treatment of Parkinson's and to promote stroke recovery) will improve treatment and health outcomes for neurological patients.

### **CMDHB Future Model of Care - Neurology**

Due to the highly sub-specialised nature of neurologist service, there are benefits to continuing with centralised services however greater level of local delivery. Specialist investigations, however such as EEG, EMG could continue to be provided through the hub at GCC.

The current hub and spoke model has been confirmed by the ADHB and CMDHB clinical teams and both have endorsed the need to have greater input and presence locally to ensure good access for the Counties Manukau population. This will be modeled along the line of clinical networks where groups of health professionals from various organisations work together across the continuum of care in a coordinated manner to achieve the best patient outcomes. This is irrespective of which DHB or PHO patients belongs to.

With increased module capacity at MSC in 2009, some outpatient FSA Priority 1 and more follow-up consultations will be provided by visiting ADHB neurologists at MSC. Priority 2 & 3 FSA patients and subsequent follow up appointments will continue at MSC.

Current outpatient volumes require approximately 8 clinics per week of which 1.5 are provided at MSC and the balance at GCC, it is expected/anticipated would expect the volume of clinics to increase as a total over time, but also that at least 75% of the clinics will be provided at MSC in the future.

Inpatient services will be continued to be provided at ACH but as a large proportion of a Neurology service is ambulatory, CMDHB requires more outpatient assessment, diagnosis and

follow up to be provided locally and a daily presence in the inpatient services for provision of neurology consults will also be required into the future.

### **CMDHB Future Model of Care - Stroke Services**

The impact of stroke in New Zealand is significant. It is the third leading cause of death and the greatest cause of disability. Reducing the incidence and impact of cardiovascular disease is one of the thirteen New Zealand Health Strategy immediate action priority objectives for population health.

There is increasing evidence to support the development of organised stroke services in New Zealand. Organised stroke services provide the benefits of early assessment and timely intervention and have been proven to reduce both morbidity and mortality following stroke. The benefits apply to all patients regardless of age, stroke severity or co-morbidities, and are sustained for at least 5-10 years.

The aim of this service approach is to implement organised stroke care, assist best practice through use of the stroke guidelines, and improve outcomes for people with stroke and transient ischaemic attack (TIA). This approach covers the management of patients with stroke from onset through rehabilitation, both inpatient and community-based.

Efficient and effective management of patients depends upon a well-organised, expert service that can respond to the particular needs of each patient. Consequently, the organisation of stroke services and care of patients must be considered at every level of service delivery provision including:

- Primary care
- Access to investigations
- Hospital
- Community services (including both rehabilitation and support services)
- Liaison with volunteer organisations (e.g. Stroke Foundation)

### **Definition of Stroke**

Stroke is defined by the World Health Organisation as a condition characterised by rapidly developing symptoms and signs of a focal brain lesion, with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin. Transient ischaemic attacks (TIAs) are defined as where these symptoms and signs last less than 24 hours. TIAs share the same causes as stroke and may precede a stroke. (WHO MONICA Project 1988) This service specification includes rehabilitation of people with stroke due to SAH (Subarachnoid Haemorrhage) but does not include the neurosurgical management of SAH.

The New Zealand Guidelines Group (NZGG) Stroke Guidelines (NZ Stroke Guidelines) provide more detailed information on the care of patients with stroke for DHB stroke multi-disciplinary team.

All patients with a definite or presumptive diagnosis of a new stroke or TIA should be admitted to hospital unless:

- Their symptoms have fully recovered or are rapidly recovering so that there is likely to be no or minimal interference in activities of daily living within a short period of days AND
- They live with a competent carer nominated by the person with stroke who is available to provide care, or they are able to recover home alone AND
- Diagnostic and secondary prevention issues can be addressed promptly by, or in discussion with specialist stroke services (*promptly implies 100% assessed within 7- 14 days*) AND
- There is a formal arrangement with primary care health practitioner AND
- Any required initial input from specialist rehabilitation and support services (such as DHB home help and personal care) can be instituted immediately (*immediately implies same day for support and next day for rehabilitation services*) unless minimal residual deficit only.

or

- In the opinion of the treating doctor AND the person with stroke/family of the person with stroke, no benefit to the person is likely through admission to hospital. This might apply in situations, for example, where the person was already substantially disabled or suffering from a terminal illness.

or

- Despite a full understanding of the benefits of admission to hospital, the person with stroke and their family may decide to have care at home. In this situation all patients should be offered and have access to specialist review and investigations, as well as community rehabilitation and support services (such as home help and personal care) which should be instituted immediately (*immediately implies same day for initial support, next day for rehabilitation services*).

### **Requirements for high quality Stroke Services at CMDHB**

A Stroke service at CMDHB would be scoped in accordance with the criteria below, and consistent with Level 4 of the NSW Delineation Model. The service would be configured to manage mild stroke. Research shows that these types of strokes are often at greatest risk of recurrent more severe stroke. To enable this would require:

- A neurovascular outpatient clinic at the Manukau SuperClinic that is able to respond to urgent referrals.
- A continued strong and enhanced relationship with vascular services with ready access to Doppler ultrasound and MRI when necessary.
- The third SMO (described above for all Neurology services) who would be jointly appointed by ADHB/CMDHB and would provide CMHB residents locally with stroke services. There is also an appointment to be made by the CMDHB services for a Geriatrician/ Stroke senior medical officer in the near future for the new Geriatric ward being introduced in 2008.
- Stroke services for acute stroke and rehabilitation will be co-located to achieve the full benefits of an integrated Stroke Service.
- A strong community team the presence of which will impact on inpatient length of stay. Secondary prevention clinics are now run at all our peripheral clinics, and are an important part of the stroke service. In the future this is likely to involve Clinical Nurse Specialists, or additional registrar involvement.

CMDHB plans to continue to develop a multi-disciplinary Stroke model, Neurologist-led with linkages and input from General Medical Physicians, Geriatricians, Stroke Nurse Specialist, Ward Nurses, Allied Health and Junior Medical Staff. The multi-disciplinary model will include strong linkages with professional groups within community and primary care to ensure an adequate continuity of care across the continuum.

Specific characteristics of the Stroke Unit are:

- Designated Stroke Unit with 10 beds based on a General Medical ward.
- Lead Neurologist for the service.
- A coordinated multi-disciplinary team inclusive of Geriatrician with Stroke sub-specialty.
- Multi-disciplinary team with specialist expertise in stroke and rehabilitation.
- Acute Thrombolysis service.
- Education programmes for staff, patients and carers.
- Agreed protocols for common problems.
- An outpatient neurovascular service or clinic for the rapid assessment of transient ischaemic attack and minor stroke so that patients discharged from EC and Medicine can be appropriately investigated and followed up. Patients ideally should be seen in 1-2 weeks.
- Timely access to brain and vascular imaging services.
- For patients not admitted to hospital, timely assessment, investigation and on-going treatment/management in the community.
- Integration of all the above service components including primary and secondary services

- A strong, well resourced community team.

### **Neurology Workforce**

Additional appointment will be required at ADHB to support the development of services at MSC. These will be required across all professional groups including nurses and allied health staff with expertise in stroke care.

To support the links between the CMDHB stroke service and ADHB, a joint SMO appointment across CMDHB and ADHB is proposed as part of the current Stroke SMO ward-based team at Middlemore Hospital. The appointment of a Stroke Nurse Specialist would also significantly enhance the coordination of acute stroke inpatients.

A comprehensive outpatient service provided at MSC would involve local provision of nurse specialist services and close local links with neurology support workers. This level of detail will need to be developed collaboratively with the ADHB Neurology Service as under a hub and spoke model, these might best be provided by ADHB.

Provision of an increased service at CMDHB facilities by the ADHB Neurology service on an outreach basis is agreed in principle by both parties. The detail of future changes will be worked through a full Regional Service Planning (RSP) process proposed in the next two years.

## **4.0 Key Directions**

- ✓ *Development of outpatient services at Manukau to ensure that most outpatient services for CMDHB residents are delivered locally.*
- ✓ *Enhanced visiting specialist neurologist services for inpatients at Middlemore Hospital.*
- ✓ *Further development of the integrated Stroke service at Middlemore Hospital.*
- ✓ *Further development of Nurse Specialists to support case management and support integration of care between primary and secondary care providers.*

## APPENDIX ONE: CURRENT NEUROLOGY ACTIVITY

### 1.0 CURRENT ACTIVITY: NEUROLOGY INPATIENTS BY SERVICE RELATED GROUP

BY SRG				2004/05			2005/06			2006/07			
Patient Type	Admit Type	Day/Inpatient	Agency code	Discharges	Caseweights	acw	Discharges	Caseweights	acw	Discharges	Caseweights	acw	
Adult	Acute	Daypatient	Northland	1	0.52	0.52				4	1.25	0.31	
			Waitemata	8	1.86	0.23	14	4.29	0.31	9	3.28	0.36	
			Auckland	117	45.95	0.39	114	44.75	0.39	127	51.13	0.40	
			Counties Manukau	431	116.44	0.27	508	150.81	0.30	516	159.40	0.31	
			Non Northern Region	6	1.51	0.25	7	2.44	0.35	7	2.19	0.31	
		<b>Daypatient Total</b>			<b>563</b>	<b>166.29</b>	<b>0.30</b>	<b>643</b>	<b>202.28</b>	<b>0.31</b>	<b>663</b>	<b>217.25</b>	<b>0.33</b>
		Inpatient	Northland	2	1.32	0.66				2	1.76	0.88	
			Waitemata	5	2.50	0.50	5	2.06	0.41	10	4.98	0.50	
			Auckland	86	69.55	0.81	77	69.84	0.91	78	71.38	0.92	
			Counties Manukau	1000	670.38	0.67	1024	633.68	0.62	1030	654.43	0.64	
	Non Northern Region		10	5.23	0.52	8	3.45	0.43	9	4.54	0.50		
	<b>Inpatient Total</b>			<b>1103</b>	<b>748.99</b>	<b>0.68</b>	<b>1114</b>	<b>709.03</b>	<b>0.64</b>	<b>1129</b>	<b>737.08</b>	<b>0.65</b>	
	<b>Acute Total</b>			<b>1666</b>	<b>915.28</b>	<b>0.55</b>	<b>1757</b>	<b>911.31</b>	<b>0.52</b>	<b>1792</b>	<b>954.33</b>	<b>0.53</b>	
	Elective	Daypatient	Auckland	1	0.19	0.19	2	1.03	0.51				
			Counties Manukau	8	1.63	0.20	3	1.21	0.40	10	4.39	0.44	
			Non Northern Region	1	0.19	0.19							
		<b>Daypatient Total</b>			<b>10</b>	<b>2.02</b>	<b>0.20</b>	<b>5</b>	<b>2.24</b>	<b>0.45</b>	<b>10</b>	<b>4.39</b>	<b>0.44</b>
Inpatient		Auckland	4	2.64	0.66	4	3.49	0.87	1	2.33	2.33		
		Counties Manukau	2	1.63	0.82	1	1.40	1.40	1	0.54	0.54		
<b>Inpatient Total</b>			<b>6</b>	<b>4.28</b>	<b>0.71</b>	<b>5</b>	<b>4.89</b>	<b>0.98</b>	<b>2</b>	<b>2.86</b>	<b>1.43</b>		
<b>Elective Total</b>			<b>16</b>	<b>6.29</b>	<b>0.39</b>	<b>10</b>	<b>7.13</b>	<b>0.71</b>	<b>12</b>	<b>7.25</b>	<b>0.60</b>		
<b>Adult Total</b>			<b>1682</b>	<b>921.57</b>	<b>0.55</b>	<b>1767</b>	<b>918.44</b>	<b>0.52</b>	<b>1804</b>	<b>961.58</b>	<b>0.53</b>		

Child	Acute	Daypatient	Northland	1	0.19	0.19	1	0.30	0.30	1	0.29	0.29
			Waitemata							1	0.17	0.17
			Auckland	31	9.15	0.30	43	15.78	0.37	36	14.50	0.40
			Counties Manukau	156	45.53	0.29	179	53.76	0.30	144	43.16	0.30
			Non Northern Region	5	1.14	0.23	1	0.30	0.30	1	0.29	0.29
		Daypatient Total	193	56.01	0.29	224	70.15	0.31	183	58.41	0.32	
	Inpatient	Northland								1	0.29	0.29
		Auckland	33	27.85	0.84	29	20.51	0.71	24	24.57	1.02	
		Counties Manukau	172	90.87	0.53	145	67.49	0.47	145	67.48	0.47	
		Non Northern Region	1	0.35	0.35	4	2.10	0.52	2	1.62	0.81	
	Inpatient Total	206	119.06	0.58	178	90.10	0.51	172	93.96	0.55		
	Acute Total	399	175.06	0.44	402	160.25	0.40	355	152.36	0.43		
	Elective	Daypatient	Auckland	13	5.20	0.40	17	7.47	0.44	2	0.94	0.47
			Counties Manukau	40	9.77	0.24	32	13.70	0.43	62	26.12	0.42
		Daypatient Total	53	14.98	0.28	49	21.18	0.43	64	27.06	0.42	
		Inpatient	Auckland	2	1.15	0.57	2	1.70	0.85	5	4.63	0.93
			Counties Manukau							1	0.40	0.40
Inpatient Total	2	1.15	0.57	2	1.70	0.85	6	5.04	0.84			
Elective Total	55	16.12	0.29	51	22.88	0.45	70	32.10	0.46			
Child Total	454	191.19	0.42	453	183.13	0.40	425	184.46	0.43			
Grand Total	2136	1112.76	0.52	2220	1101.57	0.50	2229	1146.05	0.51			

## 2.0 CURRENT ACTIVITY: NEUROLOGY INPATIENTS BY PURCHASE UNIT GROUP

BY PUC				2004/05			2005/06			2006/07			
Patient Type	Admit Type	Day/Inpatient	Agency code	Discharges	Caseweights	acw	Discharges	Caseweights	acw	Discharges	Caseweights	acw	
Adult	Acute	Daypatient	Auckland	72	33.80	0.47	55	26.02	0.47	71	34.65	0.49	
			Non Northern Region				1	0.27	0.27	1	0.30	0.30	
		Daypatient Total			72	33.80	0.47	56	26.30	0.47	72	34.95	0.49
		Inpatient	Auckland	61	59.19	0.97	58	67.43	1.16	52	94.30	1.81	
	Non Northern Region		1	0.46	0.46	2	1.14	0.57	1	0.47	0.47		
	Inpatient Total			62	59.66	0.96	60	68.57	1.14	53	94.77	1.79	
	Acute Total			134	93.458		116	94.8608		125	129.7179		
	Elective	Daypatient	Auckland				1	0.66	0.66				
			Non Northern Region	1	0.19	0.19							
		Daypatient Total			1	0.19	0.19	1	0.66	0.66			
Elective Total			1	0.1923		1	0.6605						
<b>Adult Total</b>				<b>135</b>	<b>93.65</b>	<b>0.69</b>	<b>117</b>	<b>95.52</b>	<b>0.82</b>	<b>125</b>	<b>129.72</b>	<b>1.04</b>	
Child	Acute	Daypatient	Auckland	15	4.93	0.33	23	7.84	0.34	17	6.05	0.36	
			Daypatient Total			15	4.93	0.33	23	7.84	0.34	17	6.05
		Inpatient	Auckland	28	61.61	2.20	29	72.57	2.50	23	168.04	7.31	
			Inpatient Total			28	61.61	2.20	29	72.57	2.50	23	168.04
	Acute Total			43	66.5421		52	80.4128		40	174.0838		
	Elective	Daypatient	Auckland	4	1.75	0.44	8	3.16	0.40				
			Daypatient Total			4	1.75	0.44	8	3.16	0.40		
		Inpatient	Auckland				1	10.80	10.80	2	22.12	11.06	
			Inpatient Total					1	10.80	10.80	2	22.12	11.06
Elective Total			4	1.75		9	13.97		2	22.12			
<b>Child Total</b>				<b>47</b>	<b>68.30</b>	<b>1.45</b>	<b>61</b>	<b>94.38</b>	<b>1.55</b>	<b>42</b>	<b>196.20</b>	<b>4.67</b>	
<b>Grand Total</b>				<b>182</b>	<b>161.95</b>	<b>0.89</b>	<b>178</b>	<b>189.90</b>	<b>1.07</b>	<b>167</b>	<b>325.92</b>	<b>1.95</b>	

### 3.0 CURRENT ACTIVITY: NEUROLOGY OUTPATIENTS CURRENT

(Please Note: BY DELIVERY SITE FOR CMDHB RESIDENT)

	FSA			FU		
	2004/05	2005/06	2006/07	2004/05	2005/06	2006/07
DHB	857	877	898	1038	1107	1083
Auckland						
Counties Manukau (MSC)	227	260	318	155	171	230
Grand Total	1084	1137	1216	1193	1278	1313

**APPENDIX TWO: FORECAST GROWTH AT 2.9%**

**1. FORECAST INPATIENT ACTIVITY BY SERVICE RELATED GROUP**

BY SRG				Forecast Discharge Numbers @2.9% growth				Forecast WIES @ 2.9% growth				
Patient Type	Admit Type	Day/Inpatient	Agency code	2009/10	2011/12	20016/17	2026/27	2009/10	2011/12	20016/17	2026/27	
Adult	Acute	Daypatient	Northland	4	5	5	7	1.36	1.44	1.66	2.21	
			Waitemata	10	10	12	16	3.58	3.79	4.37	5.82	
			Auckland Counties	138	147	169	225	55.71	58.99	68.05	90.57	
			Manukau	562	595	687	914	173.67	183.89	212.15	282.35	
			Non Northern Region	8	8	9	12	2.39	2.53	2.92	3.89	
		Daypatient Total			722	765	882	1174	236.71	250.63	289.15	384.83
		Inpatient	Northland	2	2	3	4	1.92	2.03	2.34	3.12	
			Waitemata	11	12	13	18	5.42	5.74	6.62	8.82	
			Auckland Counties	85	90	104	138	77.77	82.34	95.00	126.43	
			Manukau	1122	1188	1371	1825	713.03	754.98	870.99	1159.23	
	Non Northern Region		10	10	12	16	4.95	5.24	6.04	8.04		
	Inpatient Total			1230	1302	1503	2000	803.08	850.34	981.00	1305.64	
	Acute Total			1952	2067	2385	3174	1039.79	1100.97	1270.15	1690.47	
	Elective	Daypatient	Auckland Counties	0	0	0	0	0.00	0.00	0.00	0.00	
Manukau			11	12	13	18	4.78	5.06	5.84	7.77		
Non Northern Region			0	0	0	0	0.00	0.00	0.00	0.00		
Daypatient Total			11	12	13	18	4.78	5.06	5.84	7.77		
Inpatient		Auckland Counties	1	1	1	2	2.53	2.68	3.09	4.12		
		Manukau	1	1	1	2	0.59	0.62	0.72	0.95		
Inpatient Total			2	2	3	4	3.12	3.30	3.81	5.07		
Elective Total			13	14	16	21	7.90	8.36	9.65	12.84		

Adult Total				1966	2081	2401	3196		1047.69	1109.34	1279.80	1703.31
Child	Acute	Daypatient	Northland	1	1	1	2		0.31	0.33	0.38	0.51
			Waitemata	1	1	1	2		0.19	0.20	0.23	0.30
			Auckland Counties	39	42	48	64		15.80	16.72	19.29	25.68
			Manukau	157	166	192	255		47.03	49.79	57.44	76.45
			Non Northern Region	1	1	1	2		0.31	0.33	0.38	0.51
		Daypatient Total	199	211	244	324		63.64	67.38	77.73	103.46	
		Inpatient	Northland	1	1	1	2		0.31	0.33	0.38	0.51
			Auckland Counties	26	28	32	43		26.77	28.34	32.70	43.52
	Manukau		158	167	193	257		73.53	77.85	89.81	119.54	
	Non Northern Region		2	2	3	4		1.77	1.87	2.16	2.87	
	Inpatient Total	187	198	229	305		102.37	108.40	125.05	166.43		
	Acute Total	387	410	472	629		166.01	175.78	202.78	269.89		
	Elective	Daypatient	Auckland Counties	2	2	3	4		1.03	1.09	1.25	1.67
			Manukau	68	72	83	110		28.46	30.14	34.77	46.27
Daypatient Total		70	74	85	113		29.49	31.22	36.02	47.94		
Inpatient		Auckland Counties	5	6	7	9		5.05	5.34	6.17	8.21	
		Manukau	1	1	1	2		0.44	0.46	0.54	0.71	
Inpatient Total	7	7	8	11		5.49	5.81	6.70	8.92			
Elective Total	76	81	93	124		34.97	37.03	42.72	56.86			
Child Total				463	490	566	753		200.98	212.81	245.51	326.75
Grand Total				2429	2572	2967	3948		1248.67	1322.15	1525.30	2030.06

## 2. FORECAST INPATIENT ACTIVITY BY SERVICE RELATED GROUP

BY PUC				Forecast Discharge Numbers @2.9% growth				Forecast WIES @ 2.9% growth				
Patient Type	Admit Type	Day/Inpatient	Agency code	2009/10	2011/12	20016/17	2026/27	2009/10	2011/12	20016/17	2026/27	
Adult	Acute	Daypatient	Auckland	77	82	94	126	37.75	39.98	46.12	61.38	
			Non Northern Region	1	1	1	2	0.33	0.35	0.40	0.53	
			Daypatient Total	78	83	96	128	38.08	40.32	46.52	61.91	
	Inpatient	Auckland	Non Northern Region	57	60	69	92	102.74	108.79	125.50	167.04	
				1	1	1	2	0.51	0.54	0.62	0.83	
			Inpatient Total	58	61	71	94	103.25	109.33	126.13	167.86	
			Acute Total	136	144	166	221	0.00	0.00	0.00	0.00	
	Elective	Daypatient	Auckland	Non Northern Region	0	0	0	0	0.00	0.00	0.00	0.00
					0	0	0	0	0.00	0.00	0.00	0.00
				Daypatient Total	0	0	0	0	0.00	0.00	0.00	0.00
		Elective Total	0	0	0	0	0.00	0.00	0.00	0.00		
Adult Total				136	144	166	221	141.33	149.65	172.64	229.78	
Child	Acute	Daypatient	Auckland	19	20	23	30	6.59	6.98	8.05	10.71	
			Daypatient Total	19	20	23	30	6.59	6.98	8.05	10.71	
		Inpatient	Auckland	25	27	31	41	183.08	193.86	223.64	297.65	
				Inpatient Total	25	27	31	41	183.08	193.86	223.64	297.65
			Acute Total	44	46	53	71	0.00	0.00	0.00	0.00	
	Elective	Daypatient	Auckland	0	0	0	0	0.00	0.00	0.00	0.00	
				Daypatient Total	0	0	0	0	0.00	0.00	0.00	0.00
		Inpatient	Auckland	2	2	3	4	24.10	25.52	29.44	39.18	
				Inpatient Total	2	2	3	4	24.10	25.52	29.44	39.18
			Elective Total	2	2	3	4	0.00	0.00	0.00	0.00	
Child Total				46	48	56	74	213.77	226.35	261.13	347.54	
Grand Total				182	193	222	296	355.10	376.00	433.77	577.32	

### 3.0 FORECAST OUTPATIENT ACTIVITY

	Forecast FSA Numbers @2.9% growth			
DHB	2009/10	2011/12	20016/17	2026/27
Auckland	978	1036	1195	1591
Counties Manukau	346	367	423	563
Grand Total	1328	1406	1622	2159

	Forecast FU Numbers @2.9% growth			
	2009/10	2011/12	20016/17	2026/27
	1131	1197	1382	1839
	169	179	206	275
	1304	1381	1593	2120