

**Counties Manukau
District Health Board**

**Vascular Surgery
Health Services Plan**

February 2008

1.0 Current Services

The Vascular Service at CMDHB operates out of Middlemore Hospital, Manukau Surgery Centre and Manukau SuperClinic providing Level 5 services (NSW Role Delineation Model). There are four General/Vascular surgeons with one of these positions currently being filled by a locum in early 2008. Specialists generally work 1:4 acute call with 6-8 elective vascular surgery lists being undertaken by the service each week.

Services provided by CMDHB include:

- Acute and elective inpatient surgery on all secondary care vascular conditions.
- Outpatient First Specialist Assessment (FSA) and Follow up consultations.
- Vascular Laboratory at Manukau Surgery Centre including (vascular sonography graft surveillance, vein mapping pre-operatively, and linked scans to SMO appointments).
- Interventional Radiology services provided by the Radiology Department at MMH.
- Vascular Specialist Nurse across both Manukau Surgery Centre and Middlemore Hospital.

Currently conditions to be transferred to the regional tertiary provide are those patients requiring surgery above the renal arteries (i.e. patients needing thoracic surgery) and children requiring vascular surgery. These tertiary services currently involve 27 appropriate referrals over a two year period (source: 2005/2007 data).

The Vascular Laboratory Service is located within the Vascular outpatients module at Manukau SuperClinic. There are three vascular sonographers (one of whom is a trainee) and they provide a joint clinic with surgeons and the Vascular Nurse Specialist. The CMDHB Vascular Laboratory is the only Vascular Laboratory within greater Auckland and it is also used by the Vascular registrars at ADHB as part of their training programme. While the highest number of referrals are from Vascular Surgeons, the referrals are received from general physicians and neurologists investigating carotid disease, or radiologists following interventional radiology procedures.

A Vascular Nurse Specialist is employed by CMDHB to undertake case management of all vascular patients with a specific focus on the complex patient and with responsibilities for ongoing education of nursing staff and patients. The Vascular Nurse Specialist operates a nurse-run clinic seeing follow-up vascular patients and assessing vascular disease states.

Traditionally the service model has involved general and vascular surgeon appointment. With 50% of their commitment being general surgery, a four-surgeon service is required and this provides 1:4 cover which is considered the maximum frequency for on-call. The British Society for Vascular Surgery now recommends 1:6 call¹. This level of frequency is not currently being met in any unit in New Zealand and 1:4 call is generally considered acceptable.

At the currently level of referrals, the present throughput level is generally able to meet referral demand as evidenced by prompt treatment and acceptable waiting lists with the exception of vascular access for renal patients.

Currently all vascular surgery at CMDHB is being provided on the Middlemore Hospital site with the exception of several minor-intermediate procedures (e.g. varicose vein surgery) on patients with "predictable outcomes" which is undertaken at Manukau Surgery Centre. Planning was undertaken in 2006 to consider the transfer of select elective vascular surgery conditions to MSC. This development occurred largely in response to cancellations due to the shortage of ICU beds at Middlemore Hospital at that time. Cost estimate for the additional theatre equipment at MSC was \$390,000.

¹ Source: The Provision of Vascular Services, Vascular Surgical Society of Great Britain and Ireland 2004, page 18.

Manukau Surgery Centre is geared to accommodate elective surgical patients with “predictable” outcomes. The clinical support infrastructure at Manukau Surgery Centre is challenged to provide the 24/7 support of vascular patients with less predictable post-operative requirements. In 2008 the Middlemore Hospital expansion of ICU beds (from 7-12) and the development of six HDU will provide timely and responsive access for elective surgery at Middlemore Hospital. There is no further plan to transfer additional types of Vascular Surgery to Manukau Surgery Centre after taking into account:

- Greater availability of ICU/HDU beds at MMH.
- The “unpredictable” nature of major vascular surgical post-operative requirements.
- Complexity of providing a 24/7 vascular service across two sites with the low numbers of specialists participating in the service.
- Cost of duplicating equipment across both sites.

CMDHB has four interventional radiologists providing a comprehensive 24/7 service at Middlemore Hospital that supports many other specialties. A significant proportion of the interventional radiology undertaken at CMDHB is vascular and these high volumes are expected to continue in the future. The Vascular Service is also a significant user of MRI and CT.

At Middlemore Hospital, on-site Vascular Surgery plays an important role in the support of other surgical services where joint procedures are frequently undertaken, or where specialist consultation occurs. This is particularly important in the provision of orthopaedic and trauma surgery, and in supporting the renal service.

The Middlemore Hospital Intensive Care Unit is used by 29.7% of vascular surgery patients with an average length of ICU stay for these patients of 1.7 days. This equates currently to an average of 0.5 beds being occupied by vascular patients and this is significantly weighted on weekdays aligning with elective surgical procedures. Most of the post-operative care in ICU is scheduled pre-operatively with much of this post-operative care suitable for the new HDU being commissioned in 2008. This will result in a commensurate and immediate reduction in ICU bed demand. Currently 50% of elective vascular patients have their surgery cancelled at each booking due to lack of ICU beds. Planned increases in ICU bed numbers will allow the service to operate more efficiently.

The Vascular Service plays an important role in forming Arteriovenous (AV) fistula and providing temporary venous access for haemodialysis patients. These demands will increase significantly with the growth in the number of renal dialysis patients, and with more patients remaining on programmes longer and requiring repairs/ or “re-dos”. Similarly the incidence of vascular disease will continue to increase alongside growth in the incidence of diabetes (with its associated vascular problems) and associated with an ageing population.

Data Analysis

CMDHB provides 33% of the regional vascular surgery CWD volume by SRG and provides 90% of the CWD volume by SRG for CMDHB residents².

- There were 429 Vascular Surgery discharges from CMDHB in 2006/2007. Of these discharges, 305 were elective, 98 Acute and 26 Acute Arranged³.

Principle Procedures by Discharge 2006/2007	
Procedure Types	Discharges
Varicose Vein Procedures	32
Limb Bypass Procedures	44
AAA Procedures	34
Carotid Procedures	33

² Source: Gary Jackson, Dean Papa (CMDHB)

³ Source: Decision Support (CMDHB)

Embolectomy	11
Angioplasty	155
Amputation Procedures	42
Miscellaneous	14
	356

- 100 CMDHB residents were treated at ADHB over the two year period (2005-2007)⁴. Of these 100 patients, 27 were appropriate tertiary adult patients or were children. All the remaining 73 patients (18 elective and 55 acute) would have been appropriately managed at CMDHB facilities by CMDHB clinicians. This would equate to an increase of 36 patients per annum i.e. 10% on the current volumes being undertaken at CMDHB. Through repatriating these patients, CMDHB would be supporting ADHB to provide a more responsive tertiary service and improve their secondary service to other Northern Region DHBs. Management of appropriate referral of acute vascular patients will require education of General Practitioners and St John Ambulance to ensure patients are directly referred to CMDHB.
- 29.7% of all vascular patients were admitted to ICU at some point of their hospital stay with most patients planned admissions from recovery to ICU for immediate post-operative care. Total ICU beddays are 179 beddays per annum with an average ICU length of stay 1.7 days and average occupancy of 0.5 beds.
- Estimates of volume growth into the future can be made using current throughput plus appropriate repatriation of patients from ACH, the predictions of growth based on both population growth and increased disease incidence.

2.0 Key Issues

Ensuring long term clinical sustainability

CMDHB is required to ensure the short, medium and long term sustainability of Vascular Surgery with particular need to support associated CMDHB services (e.g. ICU, Diabetes, Dialysis, major trauma, general surgery, orthopaedic surgery).

Service configuration for forecast increases in patient needs and volume growth

With high rates of forecast growth and the increasing service needs associated with ageing and dialysis, CMDHB needs to ensure adequate service configuration for the creation of surgical capacity into the future.

3.0 Trends and Future Directions

- Vascular conditions are generally chronic in nature with most patients requiring management and long term association with a clinician. Continuity of care across community, primary and secondary care is therefore important.
- The CMDHB Vascular Service needs to meet both acute and elective needs and this includes access to theatre intervention.
- Need for ongoing collaboration with other services particularly interventional radiology, trauma, diabetes and renal. The development of CMDHB based medical oncology services will increase the requirements on the vascular service for creating long term vascular access for oncology patients.
- Devolution of care to nurse specialists and primary care where appropriate is critical as is the ability to access the full ranges of investigations required to determine the diagnosis and an appropriate treatment plan.

Reports from the United Kingdom

⁴ Source: Decision Support Services (CMDHB)

- Between 1998 and 2007, the Vascular Surgical Society of Great Britain and Ireland has developed a number of documents that are useful in planning the development of Vascular Surgical Services. There are no similar publications by the Australasian College for reference.

Of key note from these reports is the following:

- Major units considered able to stand alone are generally servicing a population of 500,000 or more. Such a unit would have interventional radiologists, vascular anaesthetists, ITU, HDU and a Vascular Laboratory.
- “From the data on workload a population of about 150,000 will generate an appropriate clinical caseload for one full-time consultant vascular surgeon with expertise and teaching. Thus an ideal vascular unit would have a minimum of four consultant vascular surgeons catering for a population of at least 500,000⁵”.
- By 2004, the British Society was recommending a call frequency of 1:6⁶. It can be noted that this may in part reflect the far higher intervention and potentially prevalence of vascular disease currently.
- A UK report in 1998 proposed the closure and centralisation of vascular surgery but this has subsequently been revised (2004) into promotion of clinical networks.
- “In the United Kingdom, centralisation aimed at providing high volume vascular units is being planned in only 2% of units. On the contrary, over 40% of adjacent hospitals with a vascular service in the UK have now established clinical network arrangements for emergency vascular rotas, whilst retaining their elective vascular services locally. Where these arrangements have been established they work well and collaboration is now the most common way of providing emergency vascular services⁷”. Centralisation in the UK has demonstrated some reduction in service delivery to smaller hospitals. A key issue for CMDHB is that any loss of vascular surgery would have significant issues for many existing and future services, particularly Intensive Care, Trauma (CMDHB is a regional trauma service with referrals to the supra area service in Auckland as required), diabetes and renal.
- Data from the Vascular Registry returns in the UK to the VSSGBI shows that a population of 100,000 generates the following cases per annum:

	Benchmark	Benchmark	CMDHB ⁸	CMDHB ⁹	CMDHB
	Average	Range	Benchmark	Range	Actual
Arterial operations ¹⁰	70	46-92	308	202-405	
Interventional Radiology	47	40-75	207	176-330	
Venous Operations ¹¹	81	32-125	356	141-550	

- To manage these volumes the British Society recommends a hospital with a vascular service needs a minimum of one pure vascular surgeon per 150,000 population, or one General or Transplant surgeon with a major vascular interest per 100,000 population to reflect the time needed for their other interests.
- Note that Interventions rates in New Zealand are currently considerably lower than the UK intervention rates.
- The UK reports recommend on-call frequency of no more than 1:6 and that a vascular surgeon and radiologist should work on the same site and operate as a team.
- The report advocates development of clinical networks: “A clinical network exists when two or more adjacent hospitals collaborate to provide a service to patients. That

⁵ Source: The Provision of Vascular Services, The Vascular Society of Great Britain and Ireland, 1998

⁶ Source: The Provision of Vascular Services, Vascular Surgical Society of Great Britain and Ireland, 2004

⁷ Source: The Provision of Vascular Services, Vascular Surgical Society of Great Britain and Ireland, 2004

⁸ Benchmark figure per current CMDHB population

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¹⁰ 30-40% of arterial conditions are urgent of emergency due to threat of loss of life and limb (The Provision of Vascular Services, Vascular Surgical Society of Great Britain and Ireland 2004, page 18 UK, 2004)

¹¹ Excludes renal access surgery

service might include both elective and emergency care or it might provide simply for emergencies. A number of models exist, according to the level of vascular service in the participating hospitals¹². These clinical networks can include interactions including combined Multi-Disciplinary Team (MDT) meetings, shared protocols, shared peer review, journal clubs and academic meetings.

CMDHB Future Direction

- The Vascular Surgery service at CMDHB is clinically sustainable into the future using the current model of shared Vascular/General Surgeons and using the UK benchmark that a fulltime surgeon can service a population of 150,000 people or a part-time surgeon 100,000. The current CMDHB population of 440,000 is predicted to increase to 580,000 in 2026. Dependent on service configuration, patient demand and technological changes, there may be the need for a fifth/sixth surgeon at some time in the future, particularly if the 1:6 ratio for call becomes mandatory. At current levels of service delivery, a four-surgeon team of general/vascular surgeons is sustainable.
- Recruitment to fill new positions or vacant positions due to retirements in the next 20 years appears sustainable.
- The Vascular Society has an audit system that provides assurance as to the quality of vascular surgery across New Zealand. Ensuring regular reporting into this system alongside robust local clinical audit is important for ensuring clinical governance.
- Currently significant vascular surgery volumes are being treated at ADHB outside agreed vascular surgery referral patterns and Inter-District Flows (IDF) agreements. These volumes should be repatriated to CMDHB in 2008. In addition to supporting the development and volume base of CMDHB services, this will assist ADHB to provide a more responsive secondary service to other DHBs and to meet regional tertiary commitments.
- Demand for vascular surgical services at CMDHB and the management of vascular conditions will increase at CMDHB both with ageing of the population, and with the significant raw population increase being forecast at CMDHB. Screening for Aortic Abdominal Aneurism is likely in the next two-ten years. This will reduce the rate of acute AAA repair by identifying patients with AAAs requiring elective surgery, or patients with small AAAs requiring ongoing surveillance by the vascular service. Major forecast increases in diabetes with resultant increases in vascular disease and dialysis will significantly drive increased vascular surgery requirements.
- The current indications for conditions that are appropriately managed at the regional tertiary service provider (ADHB) is likely to continue for the foreseeable future. These procedures will increase proportionately with demographic growth in the same manner as other procedures.
- After the rapid growth in interventional vascular radiology over the last ten years, no significant changes in the ratio of vascular conditions treated by vascular surgeons c.f interventional radiologists are anticipated.
- While there is evidence that the CMDHB Vascular Surgery unit is clinically sustainable over the next 20 years, the option of a clinical network should continue to be explored both to support work/life balance for specialists and to provide further options for peer and quality review. In addition to exploring options for the management of acute services across both sites, a clinical network would support the clinical quality of regional services.
- The role of vascular surgery provision at CMHB is seen as critical in the support of renal, orthopaedics, trauma and plastic surgery services provided locally.

4.0 Key Directions

- ✓ *Repatriation of remaining elective and acute secondary care vascular surgery for Counties Manukau residents currently being provided by ADHB in 2008.*

¹² Source: The Provision of Vascular Services, Vascular Surgical Society of Great Britain and Ireland, 2004

- ✓ *Service expansion to accommodate growth in volumes related to rates of vascular disease and demographic growth.*
- ✓ *Continuation of acute and elective vascular surgery (excluding minor procedures on low risk patients) remaining on the Middlemore Hospital site.*
- ✓ *Continued development of service synergies in close collaboration with other CMDHB clinical teams – particularly interventional radiology, diabetes, renal, ICU and orthopaedics.*
- ✓ *Continue to pursue development of clinical network with ADHB and explore the opportunity of shared on-call systems.*
- ✓ *Development of an Abdominal Aortic Aneurism (AAA) screening programme.*
- ✓ *Expansion of the Nurse Specialist role in the management of chronic vascular disease.*