Bass Coast Regional Health

Stroke Gap Analysis

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**Introduction**

Stroke care is complex and challenging for both care providers and consumers. Equitable delivery of stroke services across Australia remains a challenge – particularly in rural and regional areas, where access to best-practice stroke services is variable [1]. Issues of distance, transport availability, workforce variations, socio-economic status and infrastructure all impact the health of Victorians living in rural and regional areas [2].

The past two decades have brought considerable advances in the treatments and technologies relevant to care of people with stroke, alongside significant increases in the cost of stroke care provision [3] [4]. The Stroke Care Strategy for Victoria [5] published in 2007 by the Victorian Department of Health and Ageing, responds to the need for greater equality and consistency in the provision of stroke care across Victoria. The Strategy provides a framework for the delivery of acute and sub-acute stroke services, aiming to guide future provision of stroke health care in Victoria, through service design and delivery and workforce development.

**Background**

The Bass Coast Regional Health (BCRH) Stroke Gap Analysis (SGA) is a reflection of the efforts of BCRH to address service shortfalls in stroke care provision that exist within the current care model and resources, with a view to improving access to evidence-based stroke care for people in Bass Coast Shire and broader South Gippsland region. Service gap analysis is achieved using recommendations from the Stroke Care Strategy for Victoria as a benchmark, and service planning is rationalised using the National Stroke Foundation’s Acute Stroke Services Framework (2011) [1].

The BCRH SGA is achieved through collegiality with the Victorian Stroke Clinical Network (VSCN) (a network within the Victorian Department of Health) and takes place in the setting of a broader framework for health care in rural and regional Victoria [2]. The BCRH SGA focuses on an identified need for effective and structured collaborations between rural and regional health services, metropolitan-based and state-wide specialty services and relevant peak professional organisations.

Development of the BCRH SGA aligns with the BCRH strategic direction [6,7] and places an emphasis on the potential benefits of new and evolving health technologies (such as Telemedicine) and a pre-identified need for a regional (or ‘big picture’) approach to stroke service planning in Gippsland.
**Objective**

The BCRH SGA aims to generate discussion about the level of resource investment required to enhance access to high quality, evidence-based acute and subacute stroke care, for all patients presenting to Bass Coast Regional Health (BCRH) Emergency Department (ED) with stroke and Transient Ischaemic Attack (TIA). The SGA aims to propose strategies for service improvement, which are reflective of current Australian clinical guidelines for stroke management [8] and align with Stroke Care Strategy recommendations.

Three areas of ‘immediate-priority’ service need have been identified for improving the care of patients presenting to BCRH ED with stroke; 1) Use of partnerships to better recognise and respond to stroke and TIA as a medical emergency, 2) Providing early access to stroke unit (SU) care for selected patients presenting to BCRH with stroke, and 3) full implementation of evidence-based protocols for clinical management of stroke and TIA in the ED.

A further three ‘future-scoping’ activities have been identified; 1) Improving access to specialist neurovascular clinics for people who present to BCRH ED with stroke and TIA. 2) Implementation of Telemedicine technologies at BCRH and 3) Development of sub-acute stroke services at BCRH.

**Data Collection and Methodology**

Hospital data relevant to the 2010-11 and 2011-12 financial years are presented. These data have been collected from the Victorian Emergency Medicine Database (a national database), using International Classification of Disease codes, and from local (hospital-based) data records (amongst other referenced sources). These data provide quantitative information about the local burden of stroke and TIA, numbers of stroke and TIA presentations, arrival modes and separation destinations for patients presenting to BCRH ED with stroke and TIA, and other relevant hospital and ED data relevant to those financial years. This information helps to justify the priority areas identified by the BCRH stroke gap analysis, using the National Stroke Foundation’s (2011) Acute Stroke Services Framework as a reference.
BCRH Community Profile and Catchment

BCRH is a key health service provider for Victoria’s southern coastal region and has been delivering quality care to the residents of Bass Coast for nearly a century. BCRH is currently the only public hospital providing acute and emergency department services to the Bass Coast Shire, which covers 865 square kilometers and is located in the South Gippsland region of Victoria, approximately 130kms from Melbourne.

Currently the fastest growing area in regional Victoria, Bass Coast Shire has a population of approximately 30,000 permanent residents, however in peak holiday season the region’s population swells to nearly 70,000 [9]. Bass Coast Shire has a greater than average proportion of residents aged over 65 years (23%), compared to the national average (13.3%), which may account for a high prevalence of chronic disease and disability within the Bass Coast Shire community [10].

BCRH provides a diverse range of community and allied health services to the residents of Bass Coast Shire, from sites at Wonthaggi, Inverloch, Grantville, Corinella and Cowes. Community services include Meals on Wheels and comprehensive training programs for community and health professionals; including apprenticeships, public health programs and clinical placement programs for medical, nursing and allied health trainees.

Figure 1: Map of Bass Coast Shire
Interdisciplinary Acute and Sub-Acute Services

BCRH is equipped to deliver an integrated range of surgical, acute medical, sub-acute/rehabilitation, ambulatory, residential care and community health services. In 2010-11 BCRH provided 7,614 episodes of inpatient care (with Geriatric Evaluation and Management (GEM) accounting for 1,970 bed days) and received 13,753 presentations to the BCRH ED [9].

Acute medical and surgical services include; obstetrics, geriatrics, orthopaedics, ophthalmology, gynaecology, paediatrics, urology, Ear nose and throat and colo-rectal specialties. On-call obstetric surgery is available after hours, however there is limited emergency theatre availability. Surgical services are provided at BCRH by a combination of local and metropolitan-based surgeons.

Patients are admitted to BCRH under the medical care and management of a General Practitioner (GP) from the Wonthaggi Medical Group (WMG). Medical coverage (including anaesthetic and obstetric care) is provided to BCRH inpatients by the WMG on a 24/7 (on-call) basis. Additionally, there is a Geriatrician employed by the hospital 1 day per week.

An Aged Care Nurse Practitioner works within the subacute inpatient program and Clinical Nurse Consultants are employed for outpatient services, including: Diabetic Educator, Continence Nurse, Cardiac Rehabilitation Nurse/Asthma Educator and Breast care Nurse.

BCRH services two wards; one acute and the other sub-acute. The acute ward comprises 30 acute hospital beds (including 4 flexible beds that may be used for ED short-stay requirements) and the sub-acute ward comprises 15 beds (including 6 GEM beds, 2 rehabilitation beds, 1 palliative care bed and 5 medical overflow beds).

Physiotherapy (PT), Occupational therapy (OT), Speech Pathology (SP), Dietetics, Podiatry and Social Work (SW) services are available to all inpatients of the acute and subacute wards, and PT, OT, Podiatry and Dietetics are additionally available to nursing home residents. Outpatient PT and OT services include the cardiac, cardiopulmonary and joint replacement clinics, home-based assessments, hand therapy and rehabilitation programs. Podiatry services are provided to community based clients.
There is currently no neuropsychology services available at BCRH and none of the allied health services are available after hours or on weekends/public holidays. There is very limited access to allied health services for ED patients.

**Diagnostic Services**

Diagnostic Imaging at BCRH is provided on a contract basis by Bass Coast Radiology (located on-site at BCRH). Computed Tomography (CT) is available 9am to 5pm, Monday to Friday) with additional on-call CT (non-contrast) availability on weekends and Public Holidays (9am to 5pm, Saturday and Sunday). Currently, CT services are not available after 5pm on any day of the week.

Ultrasound service is limited. Times of 1200 and 1630 are set aside for a limited number of urgent ultrasounds; however this does not include carotid ultrasound. Carotid ultrasound can only be attended by non-urgent appointment, and facilities are located at a site remote from the hospital. There is no ultrasound availability after hours, or on weekends/public holidays.

**Emergency Department Services**

**Demand**

BCRH ED provides 24/7 emergency medical and nursing services to the local community. Demand on the ED continues to grow, with the number of annual presentations to the ED increasing from 13,753 (in 2010-11) to 14,523 (in 2011-12). Presentations stabilised in 2012/13. To meet the increasing demand, BCRH ED expanded from four cubicles to six in 2010, with a corresponding increase in nursing staff cover and reorganisation of the medical roster and structure.

**Medical and Nursing Coverage**

BCRH ED has 24/7 medical and nursing coverage. Medical coverage is divided into two HMO shifts per day; the first shift covers the hours of 1100-2300hrs and is staffed by 1 Hospital Medical Officer (HMO) with the second shift covering the hours of 2000-0800hrs staffed by 1 HMO. From the hours of 0800-2000 a SMO and 1-2 interns also are present in the ED.

Nursing coverage is divided into four overlapping shifts per day (staffing aligns with the current Victorian Public Sector Nurses and Midwives Agreement 2012-2016 [11]). The first shift covers the hours 07:00-15:30 and is staffed by 3 Registered Nurses. The second shift covers the hours 14:30-23:00 and is staffed by 3 Registered Nurses. The third shift covers the hours 22:45-07:15 and is staffed...
by 2 Registered Nurses. A fourth shift covers the hours 12:00-20:30 and is staffed by 1 Registered Nurse. Attempts are made to ensure that the nurse in-charge of every ED shift has ED qualification and expertise.

Nurse Practitioner (NP) and/or Nurse Practitioner Candidate (NPC) in the ED. At present there is currently one Nurse Practitioner and one Nurse Practitioner Candidate in the ED.

Arrival Mode of emergency patients

There are two main arrival modes for patients presenting to the BCRH ED. Presentations generally occur via Ambulance Victoria (AV) or private vehicle. Of the 14,523 presentations to the BCRH ED during the 2011-12 financial year, 2,862 (19%) arrived by AV and the remaining 11,661 (79.6%) by private vehicle. During the 2010-11 financial year there were a total of 13,753 presentations to the ED; with 2,679 (19%) patients arriving by AV and the remaining 11,074 (79.8%) by private car. Other, less common arrival modes include police vehicle and undertaker.

Clinical Acuity of emergency patients

Clinical acuity of ED presentations (according to Triage Category) was very similar over the 2010-11 and 2011-12 financial years: During the 2010-11 financial year, presentations by Triage category included; 30 (0.2%) Cat 1; 1,296 (9%) Cat 2; 5,042 (37%) Cat 3; and 7,385 (54%) Cat 4, 5 and 6 cases. This is compared with 22 (0.15%) Cat 1; 1,323 (9%) Cat 2; 4,819 (33%) Cat 3; and 8,359 (58%) Cat 4, 5 and 6 cases during the 2011-12 financial year. Rates of admission (80%), discharge (10%) and transfer (4%) from the BCRH ED were relatively static over the 2010-11 and 2011-12 financial years.

BCRH does not have a high dependency unit (HDU) or an intensive care unit (ICU). Patients assessed in the ED as requiring high dependency/intensive care or any other specialty/time-critical care that cannot be provided at BCRH, are transferred by air or road to a tertiary centre.
Inter-Hospital Transfer of Emergency Patients

BCRH referral pathways are predominantly directed to Monash Health (including the Dandenong and Monash Medical Centre, distanced approximately 115 kilometres away with an average road travel time of 85 minutes); however no formalised processes or agreements (between BCRH and Monash Health, or any other tertiary centre) currently exist to facilitate rapid transfer of care for emergency patients.

Adult Retrieval Victoria (ARV) is often engaged to assist in the transfer of patients from BCRH ED, BCRH require specialist or time-critical care. This involves the ED Medical Officer liaising with ARV by phone and the retrieval team sourcing an appropriate hospital bed and transport services. The process is costly and disjointed and means that clinicians working in the BCRH ED are limited in their ability to rapidly transfer the care of patients requiring specialty (or time-critical) intervention, to an appropriate destination, in streamlined and efficient manner. It also means that clinicians are not afforded any feedback about patient outcomes.

All patients with suspected acute stroke who present to BCRH ED out of hours require transport to another centre to undergo urgent brain imaging, due to limited after-hours CT on-site. During the 2011-12 financial year a total of 23 patients presented to BCRH with suspected stroke or TIA and were transferred to a tertiary hospital in Melbourne to undergo CT brain imaging – at an approximate (transport) cost of $56,570.57.

711 patients required transfer from BCRH ED to another hospital (for specialty or time-critical care) during the 2011/12 financial year. Of these transfers, approximately 64% (454 cases) were transported by road ambulance, 10% (73 cases) by air ambulance and 10% (75 cases) by private ambulance. Data relevant to the remaining 11% (84 cases) were missing. These figures represent an increase from the previous (2010-11) financial year, with a total of 644 patients requiring transfer; 58% (373 cases) by road ambulance, 12% (80 cases) by air ambulance and 22% (146 cases) by private ambulance. Again, data discrepancy (relevant to 45 cases) was identified.
Residential Care Services

Attached to BCRH are two aged-care residential services, Armitage House and Kirrak House. Each service houses 30 high level care (HLC) beds. Griffiths Point Lodge Hostel located in San Remo, houses 29 low level care (LLC) beds including 1 respite bed. The average occupancy rate for residential aged care services at BCRH in 2010-11 was 93.7%.

Community Rehabilitation Services

BCRH has a Community Rehabilitation Centre (CRC) (which is currently under redevelopment and expansion). Allied Health and nursing staff provide a range of rehabilitation and outpatient services for clients with a range of conditions (including stroke) from the CRC.

Local Impact of Stroke and TIA

Three fictitious case examples of people presenting to BCRH ED with stroke are presented, in order to illustrate the various impacts of stroke on the local Bass Coast Shire population, and to identify the diverse management requirements for patients with stroke. More importantly, the case examples are intended to highlight the potential capabilities of BCRH to provide appropriate, evidence-based care to some patients who present to BCRH ED with stroke, whilst acknowledging the limitations of BCRH to provide comprehensive, specialised stroke care (including organised inpatient SU care and thrombolysis).

Case Example 1

‘Mary’ is an 89 year old great-grandmother of six who grew up on a farm in Gippsland. Her eldest daughter ‘Rose’ and three grandchildren live locally and visit weekly. Mary moved to high level residential care at Kirrak House twelve months ago, where nursing staff provide all of her daily care, due to her advanced Alzheimer’s dementia.

One Monday morning in July, the nurses attending Mary find her to be drowsy and unable to speak. She is transferred urgently to BCRH ED and a CT brain scan is performed, which evidences a large lobar intra-cerebral haemorrhage. Mary’s GCS on arrival is 8/15; she has a right-sided hemiparesis and was in respiratory distress. Chest x-ray is indicative of aspiration pneumonia.
ED medical officers discuss Mary’s condition with Rose. The decision is made to provide Mary with palliative care at Kirrak House. She is reviewed by a geriatrician with palliative care expertise and a subcutaneous infusion of analgesia and sedation is commenced. Mary is transferred back to Kirrak House later that afternoon, with instructions for break-through analgesia and sedation to treat any distress, in accordance with the BCRH stroke palliative care pathway.

Mary is reviewed daily by a palliative care specialist, but never regains consciousness and two days later, dies as a result of her stroke. Rose expresses gratitude to the nursing staff at Kirrak house for their careful and competent attention to Mary’s end-of-life care, for the kind support provided to all members of her extended family during Mary’s last days.

**Case Example 2**

‘John’ is a 64 year old bachelor who lives alone in Bass Coast Shire and works at the local fish and chip shop. He does not have any medical conditions and takes no medication. At 6:15pm on a Friday evening in November, whilst locking up the store, John notices a sudden weakness of his right hand; he drops his keys twice and notices that his hand is numb and clumsy.

John drives himself to BCRH ED (two minutes away) where he is triaged as a Category 2. He is examined by an ED physician at 6:35pm and found to have moderate weakness of his right arm and face. John’s speech has also become slow and slightly jumbled. His blood pressure is 200/96 mmHg and a 12-lead electrocardiograph shows atrial fibrillation at a rate of 125bpm.

The ED physician suspects that acute stroke is the cause of John’s sudden weakness and speech trouble and recognises that John requires an urgent CT scan of his brain and that he is currently well within the time window for potential treatment with intravenous alteplase (thrombolysis). The nurse in charge of the ED rapidly makes contact with the stroke team at a large metropolitan hospital (using a locally agreed protocol) and arranges to have John transferred by urgent road Ambulance, to be assessed and treated in a comprehensive stroke centre.

The ED physician treats John’s hypertension with intravenous metoprolol and prepares a detailed transfer summary, including the time of symptom onset and all relevant clinical findings. Following John’s departure, the ED physician phones John’s Next of Kin (his sister ‘Helen’) to explain John’s medical condition and plan of care. He provides contact details for the transfer hospital and asks that Helen remain by the phone.
Case Example 3

‘Peter’ is a 76 year old man with a past medical history of Type 2 Diabetes Mellitus, hypertension, high cholesterol and ischaemic heart disease. On a Monday morning in January, Peter’s wife ‘Hilary’ calls an ambulance for Peter, after he falls to the floor whilst getting out of bed, due to weakness of his left arm and leg. Hilary follows the ambulance to BCRH ED, where Peter is assessed by the ED physician.

Hilary explains that for two days Peter has complained of intermittent weakness of his left arm and leg. She has also noted some intermittent slurring of his speech. These episodes have been brief, lasting between 10 and 20 minutes each time. Hilary notes that on retiring to bed last night, Peter’s speech was very slurred, his face appeared droopy on the left side and she noticed him stumble a few times. Although Hilary thought about calling an ambulance last night, Peter insisted against.

The ED physician checks Peter’s blood glucose level, performs an assessment and concludes that Peter has likely experienced a subcortical stroke, with onset approximately 12 hours earlier. The ED physician uses the National Institute of Health Stroke Scale Score (NIHSS) to assess the severity of Peter’s stroke deficit, and finds a score of 5 (mild severity). The physician notes that, given the time of onset (last night), Peter is not eligible for acute stroke intervention (such as thrombolysis). A CT brain scan is performed within two hours of Peter’s arrival at ED, which evidences an evolving 2cm x 1cm lacunar infarction, located within the right internal capsule.

Peter is admitted to the acute medical ward at BCRH that day and reviewed by medical practitioner. He is assessed by a speech pathologist later that afternoon and seen by a physiotherapist the next day. Two days later Peter undergoes imaging of his carotid arteries, which shows no significant stenosis of either internal carotid arteries, and is later admitted to a rehabilitation bed at BCRH, where he makes a good recovery over the following two weeks.

Peter is referred to a neurovascular clinic in Melbourne for follow-up, and is triaged to be seen within two weeks of his hospital discharge. Rehabilitation therapists link Peter into local community rehabilitation services and arrange for him to attend the community rehabilitation centre twice a week.
**Hospital Data – Stroke and TIA**

*Table 1:* Number of presentations to BCRH ED with stroke and TIA: Comparison of 2010-11 and 2011-12 financial year data.

<table>
<thead>
<tr>
<th></th>
<th>2010-11 Financial Year</th>
<th>2011-12 Financial Year</th>
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<tbody>
<tr>
<td><strong>No. Patients with ED Diagnosis</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>53 (51%)</td>
<td>50 (56%)</td>
</tr>
<tr>
<td><strong>TIA</strong></td>
<td>51 (49%)</td>
<td>40 (44%)</td>
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<tr>
<td><strong>Patients with Stroke: Separation Destination</strong></td>
<td></td>
<td></td>
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<tr>
<td>Admitted to BCRH</td>
<td>17 (32%)</td>
<td>23 (46%)</td>
</tr>
<tr>
<td>Discharged to Usual Residence</td>
<td>7 (13%)</td>
<td>5 (10%)</td>
</tr>
<tr>
<td>Transferred to Other Health Service</td>
<td>29 (54%)</td>
<td>22 (44%)</td>
</tr>
<tr>
<td>Discharged against medical advice</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Patients with TIA: Separation Destination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admitted to BCRH</td>
<td>14 (27%)</td>
<td>12 (30%)</td>
</tr>
<tr>
<td>Discharged to Usual Residence</td>
<td>31 (61%)</td>
<td>22 (55%)</td>
</tr>
<tr>
<td>Transferred to Other Health Service</td>
<td>4 (8%)</td>
<td>6 (15%)</td>
</tr>
<tr>
<td>Discharged against medical advice</td>
<td>2 (4%)</td>
<td>0</td>
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**Stroke Service Gap Analysis**

The following table identifies the service currently provided for stroke and TIA in the BCRH ED (in the righthand column), compared with service recommendations outlined in the stroke care strategy for Victoria (in the lefthand column).

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Gaps in Current Practice at BCRH</th>
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| 1) Health Services and general practitioners should manage TIA’s and secondary prevention of stroke in accordance with existing evidence-based clinical practice guidelines. | • BCRH protocols for the management of TIA currently exist, however use of this protocol by ED clinicians is not well evidenced.  
• BCRH protocols for management of TIA require revision to ensure they are up to date and reflect current best-practice guidelines for comprehensive management of TIA.  
• Patients presenting to BCRH ED with TIA have limited access to carotid imaging services. |
| 3) Assessment/follow-up of people at risk of having a new or subsequent stroke should be undertaken at specialist TIA/neurovascular clinics. | • There is currently insufficient access to specialist TIA/neurovascular clinics in the South Gippsland region. Local residents who are at risk of new or subsequent stroke are currently required to travel long distances, in order to receive care and follow-up by specialists who are often do not have knowledge of local services.  
• BCRH does not currently receive a sufficient number of annual |
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<tr>
<th>Presentations of stroke and TIA (to the BCRH ED) to justify the establishment of a specialist neurovascular clinic (i.e. recommendation &gt; 200 presentations per year – more than double the number of presentations to BCRH in 2011-12).</th>
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<tr>
<td>5) Health services should treat all people with stroke symptoms as a medical emergency and in accordance with existing evidence-based clinical practice guidelines. This includes but is not limited to rapid triage and rapid brain imaging.</td>
</tr>
<tr>
<td>• Not all patients with stroke symptoms who present to BCRH ED are triaged in accordance with peer standards.</td>
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<td>• There is a lack of clear documentation of AV ‘ramping times’ (i.e. time-delay between ambulance arrival and ED triage) for stroke patients specifically. BCRH is currently meeting NEAT targets for transfer from ambulance to the ED for all patients presenting.</td>
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<tr>
<td>• There is currently limited clinician expertise and knowledge of stroke care within the BCRH ED.</td>
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<td>• A culture of treating stroke/TIA as a medical emergency within the BCRH ED is not universal.</td>
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<td>• There is evidence to suggest that stroke symptoms may not always be recognised by clinicians working in the BCRH ED.</td>
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<tr>
<td>• There are currently no existing local pre-notification agreements/protocols between emergency service providers (i.e. local AV groups) and BCRH.</td>
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<tr>
<td>• Access to CT brain imaging at BCRH is limited to daytime hours.</td>
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</table>
6) Acute health services should provide thrombolysis in accordance with role delineation for acute stroke services and internationally recognised clinical criteria, with appropriate neurology support, and provide information on these patients to the international SITS (Safe Implementation of Thrombolysis in Stroke) registry.

- The Acute Stroke Services Framework 2011 identifies BCRH as being a Category C: Basic hospital service (based on the number of stroke presentations per year).
- Stroke thrombolysis treatment is not available at BCRH and cannot be supported within the current infrastructure and resources.
- There is currently no existing agreement, protocol or referral process in place for patients presenting to BCRH with acute stroke, who require inter-hospital transfer to a comprehensive stroke service. This results in unnecessary delays in care provision.
- Telemedicine services are currently available within the BCRH ED but there are not established processes for its use with Stroke patients.
- On-site ITS services (i.e. to facilitate Telemedicine services and/or facilitate timely transfer of diagnostic imaging remotely) are not currently available at BCRH.

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<tr>
<th>7) Health services should provide acute stroke care in accordance with existing evidence-based clinical practice guidelines. Care should address: appropriate treatment of acute stroke; access to specialist acute stroke services (for example neurosurgery,</th>
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<tr>
<td>• BCRH does not currently employ a stroke neurologist to oversee acute stroke service development and care provision at BCRH (a geriatrician oversees the inpatient subacute program)</td>
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<tr>
<td>• ED clinicians at BCRH maintain a broad scope of practice; they are not specifically trained or educated to</td>
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recognise clinical scenarios in patients may benefit from specialist stroke services (such as neuro-surgery and interventional neuro-radiology).
- There is currently no existing stroke nurse specialist/care coordinator role or model of care at BCRH.
- BCRH does not currently have a co-located SU, nor does it have an organised interdisciplinary stroke team for acute stroke.
- There is a developing rehabilitation program provided by a multidisciplinary team, led by a Geriatrician.
- There is currently inadequate EFT coverage within the OT, PT, SP, SW and dietetics services, to meet the needs of patients with acute stroke (in accordance with best practice guidelines).
- There is limited availability of diagnostic imaging services for inpatients at BCRH, outside of daytime hours.

8) Sub-acute stroke care should be provided in accordance with existing evidence-based clinical practice guidelines. Care should address: access to specialist sub-acute services; interdisciplinary care; provision of sub-acute care across the care continuum; transition between inpatient and ambulatory care; discharge planning;

• There is currently no dedicated stroke rehabilitation program available at BCRH. It is provided within the current general subacute program which comprises 10 beds.
• Specific Clinical expertise in sub-acute stroke management exists at BCRH, requires further development which has been a focus in recent months.
ongoing care in the community.

- Interdisciplinary case-review meetings for patients with acute and sub-acute stroke are not currently held routinely at BCRH.
- There is currently no specific early supported discharge or transitional programs, for stroke survivors returning to the community or transitioning to residential care.

9) Appropriate and culturally sensitive palliative care should be provided and communication with carers/family members undertaken in accordance with existing guidelines and Strengthening palliative care – a policy for health and community care providers 2004-09.

- BCRH currently has sufficient capacity to provide clinically appropriate, evidence-based palliative care to dying patients, within the existing resources and infrastructure.
- Palliative care could be optimised for stroke patients at BCRH, through the development of a BCRH stroke palliative care pathway and integration of existing palliative care services.
- Palliative care services could be extended, in order to support the provision of palliative care within residential settings (i.e. Kirrak House, Armitage House), where appropriate.

11) General practitioners should be engaged in the care of stroke survivors as early as possible following diagnosis to ensure ongoing and appropriate clinical care and support; which should include: managing known risk factors for stroke; referring to and linking with community care providers.

- Communication between BCRH clinicians and primary health care providers could be improved, through engagement activities and use of comprehensive discharge summary (outlining plan of care and follow-up requirements).
- Appropriate written information and
<table>
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<tr>
<th>rehabilitation and self-management programs; referring to appropriate specialist clinical services.</th>
<th>patient education resources relating to stroke and TIA are widely available, however not all BCRH ED clinicians are not familiar with these resources and so do not routinely provide available resources to patients presenting to BCRH ED with stroke and TIA.</th>
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| 12) Acute stroke care should be provided by stroke units that are led by a physician with an interest and expertise in stroke treatment and supported by an interdisciplinary team. | • BCRH has a geriatrician overseeing the full sub acute program, but not specifically dedicated to stroke - either acute or rehabilitation.  
• There is currently no existing stroke nurse consultant role at BCRH.  
• There is currently no organised inpatient SU care model, nor organised interdisciplinary stroke team at BCRH.  
• There is currently inadequate EFT for OT, PT, SP, SW and dietetics services to meet the needs of patients with acute stroke (in accordance with best practice guidelines).  
• There are currently no existing agreements, protocols or referral processes in place, for patients with acute stroke who require transfer to a health facility equipped with a comprehensive stroke service. |
13) People with stroke and who are assessed as requiring rehabilitation and other sub-acute services should receive those in a program that has the following features:

- an interdisciplinary approach to care with a full range of medical, nursing and allied health professionals;
- a physical environment that facilitates the rehabilitation process, is enabling for ongoing recovery and is easy to navigate for people who have mobility problems, visual deficits or cognitive impairment;
- equipment necessary to facilitate the provision of quality rehabilitation program.

15) Sub-acute inpatient care should be led by a physician with an interest and experience in rehabilitation, supported by an interdisciplinary team and collocated within the appropriate inpatient environment.

16) People with stroke receiving sub-acute care should have access to a full range of medical, nursing and allied health care in an appropriate environment with access to appropriate evidence-based rehabilitation interventions, which is supported by the role delineation of sub-acute services.

- There is currently no dedicated sub-acute stroke rehabilitation program at BCRH; however there is significant potential to augment existing rehabilitation services, in order to achieve this type of service and development of this expertise has been a focus in recent months.
- EFT for OT, PT, SP, SW and dietetics services would need to be increased, in order to provide best-practice care for patients with sub-acute stroke at BCRH.
- There is currently no specific early supported discharge program for people with sub-acute stroke at BCRH, except referral to CRC for allied health services.
- There is currently limited specific nursing expertise relative to sub-acute stroke care at BCRH.
- Within current resources there exists capacity to link patients with sub-acute stroke (who are transitioning from inpatient to ambulatory care settings) into local community rehabilitation services and programs.
- A purpose-designed environment, which has the potential to appropriately meet the rehabilitation and care needs of patients with sub-acute stroke, currently exists at BCRH (i.e. includes wheelchair access, community rehabilitation centre allied health facilities and equipment).
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<td>17) All health services should implement role delineation for acute stroke services to guide service delivery and future planning to ensure provision of the appropriate level of acute stroke care and expertise in accordance with infrastructure and resources. Role delineation will also ensure health services establish appropriate linkages and referral processes to ensure people with stroke have access to appropriate expertise and resources as required.</td>
<td>• There is currently no clear role delineation to identify responsibilities for stroke service planning and development at BCRH.</td>
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<td>19) Health services should transfer/refer patients to appropriate acute stroke services for accurate diagnosis of stroke, and transfer patients when clinically appropriate- back to acute or sub-acute settings close to where they reside.</td>
<td>• Formalised, stroke-specific inter-hospital agreements/partnerships do not currently exist at BCRH, nor do approved processes for inter-hospital transfer of patients with acute and sub-acute stroke to and from BCRH.</td>
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<td>20) Health services should develop linkages and develop referral pathways and protocols with hospitals that receive their patient transfers and/or referrals to facilitate timely and smooth patient transition.</td>
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<td>22) Information about stroke and treatment options should be provided to patients and their carers/family members throughout the care continuum to allow participation in decision making, and ensure that personal choices, values and beliefs are considered in accordance with evidence-based guidelines.</td>
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<tr>
<td>• Written patient information about stroke is currently not routinely provided to patients with stroke and TIA who present to BCRH ED.</td>
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<th>23) Health services should identify for each patient and their carer/family member a single point of contact that will be responsible for ensuring ongoing communication between the stroke care team and the patient/their carer. This role would also coordinate other needs of patients and carers as required.</th>
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<td>• There is currently no stroke care coordinator role at BCRH, nor is there an organised inpatient stroke care team. •</td>
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Areas of Priority

Three areas of ‘immediate-priority’ service need have been identified for improving the care of patients presenting to BCRH ED with stroke and TIA;

1. Use of partnerships to better recognise and respond to stroke and TIA as a medical emergency,
2. Enhancing early access to SU care for patients presenting to BCRH with stroke, and
3. Full implementation of evidence-based protocols to guide clinical management of stroke and TIA in the ED.

A further three ‘future-scoping’ activities have been identified;

1. Improving access to specialist neurovascular clinics for people who present to BCRH ED with stroke and TIA,
2. Implementation of Telemedicine technologies for stroke care, and
3. Further development of a sub-acute stroke services.

Discussion

The Acute Stroke Services Framework 2011 identifies BCRH as being a Category C: Basic hospital service (based on the number of stroke and TIA presentations per year). In the last two financial years, BCRH treated 194 patients with stroke and TIA who presented to the BCRH ED. During the 2011-12 financial year, the estimated cost of emergency transport of patients with suspected stroke or TIA, for the primary purpose of receiving urgent brain imaging, exceeded $50,000.00.

Despite the high costs of emergency transport (over and above the BCRH budget) and despite resultant delays in acute care provision, no established partnership between BCRH and a comprehensive stroke centre currently exist. ED clinicians at BCRH do not have access to (locally agreed) protocols, to assist them in the identification of patients who require time-critical intervention and/or SU care, nor do not have access to a direct referral pathway for patients with suspected acute stroke who present to the BCRH ED and who cannot be appropriately managed there.
Within the current infrastructure, BCRH has limited capacity to provide specialist stroke care to patients presenting to the ED with stroke and TIA. Urgent intervention (such as intravenous thrombolysis) cannot be supported, and access to basic CT brain imaging is limited (with a daytime only service available). In order to ensure that all patients with acute stroke and TIA in the South Gippsland region receive timely and appropriate acute care (including, where appropriate, rapid access to SU care), there is an urgent need to identify and develop a Primary Stroke Centre in the South Gippsland region. This centre must be equipped with information technology services (including Telemedicine services) and have capacity to link services between metropolitan-based comprehensive stroke centers and regional basic hospital services.

BCRH policy, relevant to transport of patients with suspected acute stroke and high risk TIA, should be developed in consultation with AV. Such policies need to address the need for a (pre-identified) group of patients with suspected acute stroke and high-risk TIA to be transported directly to a primary (or comprehensive) stroke centre (i.e. thus bypassing hospitals that are unable to provide specialist/SU care or urgent brain imaging), recommendations for hospital pre-notification by AV paramedics and processes for inter-hospital transfer of care. Policy such as this is important to protect patients from lengthy delays and disjointed acute stroke care, and to prevent BCRH from high transport costs.

There may be a cohort of patients with (mild or sub-acute) stroke and TIA who could be appropriately managed at BCRH, particularly if specialist care can be provided rapidly in the (local) outpatient setting. ED and inpatient care of this patient cohort would be greatly improved with implementation of clinical protocols and practice guidelines, adapted from existing, evidence-based resources (i.e. the National Health and Medical Research Council (NHMRC) Emergency Department Stroke and Transient Ischaemic Attack Care Bundle [12] and the Quality in Acute Stroke Care program [13]) and national clinical guidelines for stroke management.

A great number of evidence-based resources exist and are readily available, to support the provision of high quality stroke care; however these resources are not being well used at BCRH. This may be due to a lack of local focus on stroke. Quality improvement activities relating to stroke service development at BCRH would be greatly enhanced by engagement of a stroke specialist clinician – implementation of such a role could significantly impact a range of existing service gaps.
Consideration should be given to the future capacity of BCRH to develop a comprehensive sub-acute stroke rehabilitation program at BCRH, through augmentation and optimisation of existing resources and greater use of an existing purpose-designed rehabilitation environment. Two important clinical roles, already established at BCRH (those of Geriatrician and Aged Care NP Candidate), are identified as key consultative roles for future service planning and development of sub-acute stroke services at BCRH. Development of a sub-acute stroke program at BCRH would not only increase the capacity of BCRH to rapidly accept patient-transfers back to the hospital, after initial assessment and treatment at a primary or comprehensive stroke centre, but would also generate a local clinician interest in specialist stroke care and promote a stroke clinical focus.

BCRH have embraced the NP role, and there are currently two NP employed on a casual basis and one full time with two NPCs. The NP role is particularly valuable in regional areas like South Gippsland, where specialist services are limited. Particular consideration should be given to the evolving role of Stroke NPs in Victoria, relevant to the planning and development of specialist TIA/neurovascular clinics on a regional level. Stroke NPs are autonomous, expert stroke clinicians who, through links with comprehensive stroke services, have regular access to considerable neurology and neurovascular expertise. NPs function in a variety of health care settings and have significant capacity to impact service gaps, build health service partnerships, augment current service provision and contribute to workforce development activities in regional Victoria.

Implementation of Telemedicine technology has been recommended, to improve access to specialist stroke care in underserved areas [13]. The Victorian Stroke Telemedicine project, a project funded by the Victorian Department of Business and Innovation and the VSCN, is now two years into implementation, and has proven successful in increasing rates of thrombolysis at a regional centre in Bendigo. The Telemedicine project is designed to link regional hospitals with stroke expert neurologists (based in Melbourne), according to an on-call roster system (with 24/7 coverage). Telemedicine technologies are expensive and need to be fully maintained and supported by information technology services. As the Victorian Telemedicine project expands into the Gippsland region, BCRH should give consideration to performing scoping exercises to assess the potential benefit of such technologies to improving quality of care and local expertise at BCRH.
## Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BCRH</td>
<td>Bass Coast Regional Health</td>
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<td>SGA</td>
<td>Stroke Gap Analysis</td>
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<td>VSCN</td>
<td>Victorian Stroke Clinical Network</td>
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<td>WH</td>
<td>Wonthaggi Hospital</td>
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<td>ED</td>
<td>Emergency Department</td>
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<td>TIA</td>
<td>Transient Ischaemic Attack</td>
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<td>SU</td>
<td>Stroke Unit</td>
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<td>GEM</td>
<td>Geriatric Evaluation and Management</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>WMG</td>
<td>Wonthaggi Medical Group</td>
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<td>PT</td>
<td>Physiotherapy</td>
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<td>CT</td>
<td>Computed Tomography</td>
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<td>AV</td>
<td>Ambulance Victoria</td>
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<td>ARV</td>
<td>Adult Retrieval Victoria</td>
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<td>HLC</td>
<td>High Level Care</td>
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<td>LLC</td>
<td>Low Level Care</td>
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<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
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<td>NP</td>
<td>Nurse Practitioner</td>
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<td>NPC</td>
<td>Nurse Practitioner Candidate</td>
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References


Bass Coast Regional Health Stroke Gap Analysis 2013