International comparisons of selected service lines in seven health systems

ANNEX 10 – REVIEW OF SERVICE LINES: DETAILS OF NETWORKS AND STANDARDS

Evidence Report

October 27th, 2014

Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**Part 2 – Maternity Service Capability Framework levels**

Part 2 – Maternity Service Capability Framework levels

The Framework has been documented so that **each service level builds upon the next and elements are only repeated when there has been an Increase in capability.** This has been done to reduce repetition within the document and aid readability and understanding.

Level 1

Complexity of care

Complexity of care needs	The mother and baby have **normal** care needs for antenatal and post partum care
Antenatal care	Outpatient and ambulatory antenatal care available
Birthing care	No planned birthing service
Postnatal care	• Outpatient and ambulatory postnatal care available • Access onsite or by referral to breastfeeding support services
Emergency care	The service has capacity to provide emergency resuscitation and care to critically ill mothers and babies until transfer or retrieval takes place

Workforce

Registered midwives/ and where registered midwives not available all the time registered nurses with access to midwifery support	
General practitioner/general practitioner obstetricians/eligible midwife	
Aboriginal and Torres Strait Islander health workers	Access to on site or by referral

Clinical support services

Pathology	Access on site or by referral to a kill range & routine maternal and neonatal specimen collection and testing services
Pharmacy	Access on site or by referral to a pharmacist and drugs supplied either on individual prescription from a private pharmacy or through hospital imprest system
Diagnostic Imang	Access on site or by referral to routine obstetric screening and diagnostic imaging services
Maternal and child health	Access on site or by referral to maternal and child health
Perinatal mental health service	Access on site or by referral to a mental health service which can provide perinatal mental health assessment and care
Interpreter services	Access to telephone interpreting service
Allied health services	Access on site or by referral to allied health services including but not limited to physiotherapy, social work, continence advisors and dieticians

Service networks and integration

Documented and formalised alignment within a maternity services network	• Documented and agreed protocol with ambulance and retrieval services • Documented and agreed consultation and referral pathway to specialist, allied health and clinical support services

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**As of Level 1 plus**

Level 2

Complexity of care

Complexity of care needs	The mother and baby have **normal** care needs for birthing and post partum care
Antenatal care	Antenatal inpatient service available Antenatal cardiotocograph (Ct) monitoring available with access to remote assessment and interpretation
Birthing care • Community based	Planned homebirth (If service Is offered) with established consultation, referral and transfer pathways to higher level services If required
• Facility based	• Birthing care in provided In dedicated birthing rooms In an acute facility or recognised birthing centre • The equivalent on site neonatal service capability can support planned birth for women with pregnancy 37 weeks gestation • Service capability supports access to or referral for emergency or unplanned caesarean section
Postnatal care	Postnatal inpatient service available

Workforce

Registered midwives	
Nurse/midwife unit manager	
General practitioner obstetricians	
General practitioner obstetricians (adv)	

Clinical support services

Pathology	On site pathology with capability to perform a range of tests including group and cross match and to provide blood products or blood substitution products within one hour.
Pharmacy	Access on site or by referral to a pharmacist and drugs supplied through hospital imprest system
Theatre	On site or access to an appropriately equipped operating theatre with requisite trained theatre staff and equipment with capability for emergency caesarean section 24 hours
Perinatal autopsy service	Access to a perinatal autopsy service

Service networks and integration

Documented and formalised alignment Within a maternity services network	• Documented and agreed process for consultation, referral and acceptance of women with more complex care needs within the maternity services network. • Formal agreement for access to operating theatre with equipment and staff capable of emergency caesarean section 24 hours with a level 3 service within the maternity service network. • Documented and agreed process for acceptance of back transfer of physiologically stable women and neonates from higher level service and to back transfer to a lower service.

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**As of Level 2 plus**

Level 3	
Complexity of care	
Complexity of care needs	The mother and baby have **normal** care needs for birthing and post partum care
Birthing care	• The equivalent on site neonatal service capability can support planned normal birth for women with pregnancy 37 weeks gestation • The service can perform continuous electronic foetal monitoring in labour where clinically indicated • The service has on site facility for emergency caesarean section • The service has capability to perform elective caesarean section at 39 weeks gestation • The service capability can support induction of labour following 39 completed weeks of pregnancy • The service capability can support vaginal birth after caesarean section following 39 completed weeks of pregnancy in accordance with clinical guidelines of the relevant Jurisdiction.
Workforce	
General practitioner (Mv)	24 hour on-call availability for emergency caesarean section
Specialist obstetrician/gynaecologist	24 hour access for consultation purposes
General practitioner (paeds)	24 hour access to medical officers with appropriate perinatal services credentials
General practitioner anaesthetist	24 hour on-call anaesthetic availability for emergency caesarean section
Clinical support services	
Pathology	On site and on-call 24 hour pathology with capability to perform urgent blood and specimen testing and provide blood products and volume expanders
Pharmacy	Access on site but not on-call 24 hours to a pharmacy service
Diagnostic imaging	Access on site but not on-call 24 hours to routine obstetric screening and diagnostic imaging services
Theatre	Operating theatre on site with requisite theatre staff and equipment with capability for emergency caesarean section 24 hours
Service networks and integration	
Documented and formalised alignment within a maternity services network	Formalised arrangement as referral centre from lower level services for emergency caesarean section 24 hours, urgent obstetric screening and diagnostic Imaging.

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Evidence source	Guidance	
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**As of Level 3 plus**	
	Level 4	
	Complexity of care	
	Complexity of care needs	The mother and baby may have **normal - moderately complex** care needs
	Birthing care	The equivalent on site neonatal service capability can support planned birth for women with pregnancy ≥34 weeks gestation
	Workforce	
	Registered Midwives Nominated Midwifery clinical leader	
	Midwife Educator	Access on site or referral to
	Specialist Obstetrician I Gynaecologist Nominated Obstetric clinical leader	May be permanent to the service or visiting -24 hour on-call availability May be permanent to the service or visiting
	GP (anaes)/ Specialist Anaesthetist	24 hour On-call availability
	(GP (paeds)/Specialist Paedsf Neonatologist	24 hour on-call availability
	Registered Medical Officer (RMO)	24 hour on-call availability
	Clinical support services	
	Pathology	• Access on site to 24 hour Intrapartum foetal scalp pH or lactate sampling • Access on site to urgent blood and specimen testing, blood and volume expanders • Blood storage facilities on site. Cross-matched blood readily available.
	Pharmacy	Access on site and 24hours to a pharmacy service.
	Diagnostic Imaging	Access on site and 24 hours to urgent obstetric diagnostic Imaging and ultrasound services
	Genetic counselling/testing service	Access on site or by referral to a genetic counselling service and Invasive antenatal diagnostic procedure including amniocentesis and chorionic villus sampling
	Adult acute care	Access on site or through formalised agreement with other local service to an adult intensive care unit
	Perinatal mental health	Access on site or referral to a mental health service which can provide perinatal mental health assessment and care
	Allied health	Access to allied health services including but not limited to physiotherapy and social work
	Service networks and integration	
	Documented and formalised alignment within a maternity services network	Documented agreement with lower level services for provision of adult Intensive care services within the network (If required)
	(Continued on next page)	

Evidence source	Guidance	
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**As of Level 4 plus**	
	Level 5	
	Complexity of care	
	Complexity of care needs	The mother and baby have **normal – highly complex** care needs
	Birthing care	The equivalent on site neonatal service capability can support planned birth for women with pregnancy ≥34 weeks gestation
	Workforce	
	Head of obstetric services	
	Head of neonatology services	
	Nursing/ midwifery director	
	RMO filling one or more position recognised as an obstetric training position program (obstetric registrar)	
	RP40 filling one or more position recognised as an paediatric training position (neonata/paediatric registrar)	
	RP40 filling one or more position recognised as an anaesthetic training position (anaesthetic registrar)	
	Clinical support services	
	Surgical services	Access on site to surgical services which can support obstetric care of mothers of normal to high complexity
	Pathology	On site 24 hour blood and specimen collection service. 24 hour access to pathology
	Diagnostic Imaging	Portable ultrasound located in birth suite 24 hours for use by appropriately qualified practitioners
	Genetic counselling/testing services	Access to a genetic counselling service and Invasive antenatal diagnostic procedures Including amniocentesis and chorionic villus sampling
	Adult acute care	Access to an adult Intensive care unit
	Allied health	Access on site to additional allied health services Including but not limited to occupational therapy, continence advisors, dieticians and drug and alcohol services
	Service networks and integration	
	Documented and formalised alignment within a maternity services network	Provision of a clinical leadership role to lower level services providing 24 hour advice by a specialist obstetrician

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	**As of Level 5 plus**

Level 6

Complexity of care

Complexity of needs	The mother and baby have **normal - highly complex** care needs
Antenatal care	The service has access to a maternal foetal medicine unit
Birthing care	The equivalent on site neonatal service capability can support birth at any gestation

Workforce

Specialist in maternal foetal medicine (access to)	
Physician with obstetric expertise Anaesthetist with obstetric expertise	

Clinical support services

Diagnostic imaging	Access on site to MI range of diagnostic radiology and nuclear medicine services Including but not limited to magnetic resonance Imaging and computerised tomography
Acute care services	Dedicated acute observation area on site within maternity unit
Pathology	Full range of blood and blood products available 24 hours a day
Perlnatal mental health	Access to a dedicated perinatal mental health service
Theatre	Access on site or by referral to other level six service within the country with the requisite staff and equipment with capability to perform foal surgery

Service networks and integration

Documented and formalised alignment within a maternity services network	Statewide clinical leadership role to lower level services providing 24 hour advice by a specialist team. Initiates or provides advice relating to emergency obstetric retrieval services

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	(Continued from previous page) **1.0 Complexity of care summary for maternity service levels**

1.0 Complexity of care summary for maternity service levels

Complexity of care summary for maternity service levels	Service level					
	1	2	3	4	5	6
Emergency Care						
Resuscitation, stabilisation and retrieval	✓	✓	✓	✓	✓	✓
Complexity of Care needs						
Normal	✓	✓	✓	✓	✓	✓
Moderate complexity				✓	✓	✓
High complexity						✓
Antenatal Care						
Outpatient care	✓	✓	✓	✓	✓	✓
Inpatient care		✓	✓	✓	✓	✓
Maternal fetal medicine service						✓[1]
Planned Birthing Care						
Gestation >37 wks		✓	✓	✓	✓	✓
Gestation 34 wks				✓	✓	✓
Gestation >32 wks					✓	✓
Less than 32 wks						✓
Elective caesarean section > 39 wks gestation			✓	✓	✓	✓
Unplanned Birthing Care						
Access to or onsite facilities for emergency caesarean section		✓	✓	✓	✓	✓
Intrapartum EFM + fetal blood sampling (scalp pH I lactate)				✓	✓	✓
Postnatal Care						
Outpatient care	✓	✓	✓	✓	✓	✓
Inpatient care		✓	✓	✓	✓	✓
1 Access to						

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Evidence source	Guidance

Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)

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2.0 Workforce summary for maternity service levels

Workforce summary for maternity service levels	Service level					
	1	2	3	4	5	6
Aboriginal and Tortes Strait Islander health practitioners (access on-site or by referr4	✓	✓	✓	✓	✓	✓
Registered midwives/registered nurses	✓	✓	✓	✓	✓	✓
General practitioner obstetrician I general practitioner/eligible midwife	✓	✓	✓			
General practitioner obstetrician (a&.,anced) I general practitioner obstetrician		✓	✓	✓		
Nurse I Midwife unit manager (NUM, MUM. CNC)		✓	✓	✓	✓	✓
Specialist obstetrician/gynaecologist			✓2	✓	✓	✓
General practitioner anaesthetist			✓	✓		
Specialist anaesthetist I general practitioner anaesthetist				✓	✓	✓
Specialist paediatncian I neonatologist/ general practitioner paediatrics				✓	✓	✓
Midwfe educator				✓1	✓	✓
Nominated midwifery clinical leader				✓	✓	✓
Resident medical officer (RMO)				✓	✓	✓
RMQ filling one or more positions recognised as an obstetric Training Position Program					✓	✓
(obstetrics registrar)					✓	✓
RMO filling one or more positions recognised as an paediatnc Training Position					✓	✓
Program (peediatric regisar)					✓	✓
RMO filling one or more positions recognised as an anaesthetic Training Position					✓	✓
Program (anaesthetic registrar)					✓	✓
Specialist in maternal fetal medicine						✓2
Physician with obstetric expertise						✓
1 May be visiting or on-site						
2 Access/referral to						

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	(Continued from previous page)

3.0 Clinical support services summary for maternity service levels

Clinical support services summary for maternity service levels	Service level					
	1	2	3	4	5	6
Pathology						
On-site or referral to routine maternal and neonatal specimen collection and testing	✓	✓	✓	✓	✓	✓
On-site pathology including group and cross match and emergency transfusion		✓	✓	✓	✓	✓
Access on-site to 24 hr intrapartum fetal scalp pH or lactate sampling				✓	✓	✓
Access on-site or locally for on-call urgent blood and specimen testing			✓	✓	✓	✓
Access on-site to urgent blood and specimen testing				✓	✓	✓
Pharmacy						
Access on-site or referral to pharmacist and drugs - pnvate or hospital imprest	✓	✓	✓	✓	✓	✓
Access on-site or referral to pharmacist and drugs supplied through hospital imprest		✓	✓	✓	✓	✓
Access on-site but not on-call 24 hours to a pharmacy service			✓	✓	✓	✓
Access on-site and 24 hours to a pharmacy service				✓	✓	✓
Diagnostic Imaging/Radiology						
Access on-site or by referral to routine obstetric screening and diagnostic imaging	✓	✓	✓	✓	✓	✓
Access on-site, not on-call 24 hours, to routine obstetric screening and diagnostic Imaging			✓	✓	✓	✓
Access on-site and 24 hours to urgent obstetric diagnostic imaging services				✓	✓	✓
Portable uttrasound in birth suite 24 hrs for use by appropriately qualihed practitioners					✓	✓
Access on-site to diagnostic radiology and nuclear medicine including Magnetic Resonance Imaging (MRI) and Computerised Tomography (CT)						✓
Theatre						
On-site or access to theatre with staff and equipment capable of emergency caesarean section 24 hours		✓	✓	✓	✓	✓
Operating theatre on-site vith theatre staff and equipment for emergency caesarean section 24 hours			✓	✓	✓	✓
Operating theatre on-site or by referral with theatre staff and equipment to perform fetal surgery						✓

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Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	(Continued from previous page)

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	Service level					
	1	2	3	4	5	6
Adult Acute Care Services						
Access on-site or formalised agreement w*h other local service to an adult intensive care unit				✓	✓	✓
Access to an adult intensive care unit					✓	✓
Dedicated acute observation area on-site within maternity unit						✓
Maternal and Child Health						
Access on-site or by referral to maternal and child health	✓	✓	✓	✓	✓	✓
Pen natal Mental Health Services						
On-site/referral to mental health services for perinatal mental health assessment and care	✓	✓	✓	✓	✓	✓
Access on-site or by referral to mental health services for pennatal mental health assessment and care				✓	✓	✓
Access to dedicated perinatal mental health service						✓
Genetic Counselling/Testing Services						
Access on-site or by referral to a genetic counselling service and invasive antenatal diagnostic procedures including amniocentesis and chorionic villus sampling (CVS)				✓	✓	✓
Access to a Genetic Counselling service and invasive antenatal diagnostic procedures including amniocentesis and chorionic villus sampling (CVS)					✓	✓
Interpreter Services						
Access to telephone interpreting service	✓	✓	✓	✓	✓	✓
Allied Health Services						
Access to on-site or referral to allied health services including physiotherapy, social work, continence advisors and dieticians	✓	✓	✓	✓	✓	✓
Access to on-site allied health services including but not limited to physiotherapy and social work				✓	✓	✓
Access on-site to additional allied health services including but not limited to occupational therapy, continence advisors, dieticians and drug and alcohol services					✓	✓

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Maternity networks in Australia (11/12)

Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	(Continued from previous page) **4.0 Service network and integration matrix**

4.0 Service network and integration matrix

Service networks and integration for maternity services level						
	Service level					
	1	**2**	**3**	**4**	**5**	**6**
Network Arrangements						
Initiates emergency retrievals						✓
State-wide clinical leadership role						✓
Clinical leadership role providrng 24 hour clinical advice					✓	✓
Provision of or access to adult intensive care unit services (if not available at lower level)				✓	✓	✓
Documented and formalised alignment within the maternity services network	✓	✓	✓	✓	✓	✓
Means of Coordination						
Documented and agreed protocol with ambulance and retrieval services	✓	✓	✓	✓	✓	✓
Documented and agreed consultation and referral pathways to allied health and clinical support services	✓	✓	✓			
Documented and agreed process for consultation referral and acceptance of women with more complex care needs within the maternity services network			✓	✓	✓	✓	✓
Formal agreement for access to operating theatre with equipment and staff capable cit emergency caesarean section 24 hours with a level 3 service within the maternity service network		✓				
Formalised agreement as referral centre for lower level services for emergency caesarean section 24 hours, urgent obstetric screening and diagnostic imaging			✓			
Documented and agreed process for acceptance of back transfer of physiologically stable women from higher level service			✓	✓	✓	✓

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Maternity networks in Australia (12/12)

Evidence source	Guidance
Standing Council on Health (2012) National maternity services capability framework (http://www.qcmb.org.au/media/pdf/The%20National%20Maternity%20Services%20Capability%20Framework.pdf)	(Continued from previous page)

Criteria for categorisation of pregnancy risk

Normal care needs: A woman with a normally progressing pregnancy, with no maternal or anticipated neonatal conditions or planned interventions which may lead to pregnancy and birthing complications, may be cared for in the antenatal and postnatal period at any maternity service level by any appropriately qualified and credentialed practitioner including midwives, general practitioners and obstetricians. (However, while they may not require specialist clinical services they may choose to access them.) Such women predominantly give birth to healthy full-term neonates who do not require specialist care and therefore, birth can be planned to take place in a level 2–6 maternity unit with the woman cared for by a variety of practitioners of her choosing in either the public or private health care sectors. In consideration of some of the geographic challenges in Australia, the lower levels of the Framework which are normally associated only with normal care needs may support women to access higher levels of service for specific, more complex parts of their care

Moderate complexity: A pregnant woman with certain foetal or maternal conditions or planned interventions which may adversely impact on the pregnancy outcome may be cared for by a general practitioner obstetrician or midwife according to agreed guidelines and policies for consultation, treatment and referral or transfer in consultation with a specialist obstetrician. Care may be provided at a level 4–6 service so that available maternity and clinical support services are appropriate for the woman and baby's identified actual or potential clinical needs. Depending on clinical assessment however, level 1–3 services may also provide planned care for selected clients with moderately complex care needs. For example, in consultation with the level 4-6 facility coordinating care, level 1-3 services may provide planned occasions of antenatal care or education, and accept postnatal back transfers of physiologically stable, convalescing mothers and babies for either inpatient or community postnatal care.

High complexity: A woman who has or, due to the presence or history of certain conditions or planned interventions, is likely to develop serious maternal or foetal complications during or after the pregnancy, birth or puerperium that will require management by a multidisciplinary maternity care team including a specialist obstetrician and other high level clinical support services. Consultation with other interdisciplinary team members, which could include maternal foetal medicine specialists, other specialist physicians, neonatologists, midwives and others such as genetic counsellors, should occur as often as necessary to ensure safe, quality maternity care. Birth in a higher level 5 or 6 maternity services will usually be indicated due to the potential need for specialist adult or neonatal expertise and services. In consultation with the level 5 or 6 maternity service coordinating care, selected clients with high complexity of care needs may also have planned occasions of antenatal and postnatal care with level 1–4 services where it is deemed that in doing so, there would be no increase in the likelihood of adverse maternal or neonatal outcomes. In these circumstances, particularly for women living in remote and rural areas, provision for services such as telemedicine and the Medical Specialist Outreach Assistance Program (MSOAP) should be increasingly available.

Maternity standards in Australia – other workforce standards (1/2)

Evidence source	Guidance

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2011) Standards of Maternity Care in Australia and New Zealand	■ **Staffing for maternity services : General**
	  – All maternity units should have an Obstetrician or GP Obstetrician with primary administrative responsibility for the service
	  – Maternity service providers must ensure that medical, midwifery and ancillary staffing levels are appropriate to the clinical demand
	  – Maternity services that provide intrapartum care require a 24-hour anaesthesia and analgesia service, haematology and blood transfusion services, and a neonatal care service. Where, by virtue of location these services are not available, the woman and her family should be made aware of the limitations and be given an opportunity to birth elsewhere
	  – **Complex intrapartum cases require integrated, multi-professional specialist management and direct consultant involvement**
	  – Maternity care providers must ensure that all healthcare professionals directly involved in birth are competent in basic adult, obstetric and neonatal resuscitation and immediate care. **All staff who provide services to mothers and babies, in any location, must be trained to carry out adult and neonatal life support**
	■ **Staffing for maternity services : Obstetricians**
	  – All obstetric units must have a designated lead obstetrician
	  – **All women with risk factors for their pregnancy should be seen by an obstetrician (specialist or GP) or obstetric trainee under adequate supervision. An obstetrician (specialist or GP) should be available within 30 minutes outside the hours of consultant presence**
	  – The obstetrician must attend in a timely manner whenever requested.
	  – Complicated births in obstetric units should be attended by the obstetrician or obstetric trainee, with the degree of supervision commensurate with his/ her level of training and expertise.
	■ **Staffing for maternity services : Anaesthetists**
	  – Maternity services must nominate a designated lead anaesthetist (GP or specialist) with responsibility for the organisation and management of the obstetric anaesthetics service
	  – An anaesthetic service (specialist or GP) must be available at all times during childbirth
	  – A duty anaesthetist (specialist or GP) of appropriate competency must be available in a timely manner
	  – The anaesthetic team's response time must be such that a caesarean section may be started within a time appropriate to the clinical condition (this requires all team members to be informed of the case appropriately)
	  – **Trainee anaesthetists must be able to obtain prompt advice and help from a designated consultant anaesthetist at all times. They and their consultants must know the limits of their competence and when close supervision and help are needed. Morbidly obese women should not be anaesthetised by trainees without direct supervision**
	  – All women requiring conduct of general anaesthesia should be seen and assessed by an anaesthetist before an elective procedure.
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Maternity standards in Australia – other workforce standards (2/2)

Evidence source	Guidance

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2014) Standards of Maternity Care in Australia and New Zealand
 	
https://www.ranzcog.edu.au/the-ranzcog/policies-and-guidelines/policies-procedures-document-library/doc_view/461-standards-of-maternity-care-in-australia-and-new-zealand-c-obs-41.html
	(Continued from previous page)
	■ **Staffing for maternity services : Paediatricians**
	   – Maternity services must nominate a designated lead paediatrician (GP or specialist) with responsibility for the organisation and management of the neonatal paediatric service
	   – There must be 24-hour availability in obstetric units within 30 minutes of a paediatrician (GP or specialist) trained and assessed as competent in neonatal advanced life support
	   – Units should ensure that there are guidelines concerning the circumstances in which senior neonatal staff should attend preterm deliveries.
	■ **Organisation of maternity care: Provision of care in maternity units with service limitations**
	   – Good maternity care relies upon inter-agency collaboration, with a full range of services for all pre-existing or developing health or social needs of the mother or baby. This requires links between health and social care and provision within maternity and neonatal care networks that have the capacity to meet demand.
	   – **Maternity services that do not have adult intensive care facilities, advanced imaging and cardiology on site must have protocols in place for the care of women with significant medical or obstetric illness, to ensure that such women are delivered in a unit that can provide these resources**
	   – **Maternity services that do not have high level neonatal services should have defined arrangements for both in utero transfer and the transfer of a recently delivered mother and her newborn baby to a linked secondary or tertiary unit**

Standards for maternity services in Ontario, Canada (1/9)

Evidence source	Guidance
PCMCH, Standardized maternal and neonatal levels of care definitions, 2013 update http://pcmch.on.ca/sites/default/files/Level%20of%20Care%20Guidelines%202011%20Updated%20August1%202013.pdf	**Maternity provider service level tiers**

Level	Key Features
I A	Spontaneous preterm labour only ≥36 weeks + 0 days in absence of any other fetal maternal complications; singleton pregnancy; does not provide cesarean delivery service 24/7/365.
I B	Provides caesarean delivery service 24/7/365; can manage uncomplicated chorionic twin pregnancy.
II A	Low-to-moderate maternal risk experiencing low-risk medical/obstetrical complications where SGA is not suspected; ≥34 weeks + 0 days. Uncomplicated twin pregnancies, if <36 weeks + 0 days consider consultation and transfer.
II B	≥32 weeks + 0 days. Uncomplicated chorionic twin pregnancies if <34 weeks + 0 days consider consultation and transfer.
II C	Moderate maternal and/or neonatal risk, ≥30 weeks + 0 days. Uncomplicated twin pregnancies if <32 weeks + 0 days gestation consider consultation and transfer.
III A	High maternal risk and/or complex medical, surgical and/or obstetrical complications requiring complex multidisciplinary and subspecialty critical care at any gestational age.
III B	Any gestational age; neonatal surgery.

In addition all intrapartum care providers are expected to demonstrate:
- Competence to provide maternal and newborn care as per Society of Obstetrics and Gynaecology of Canada (SOGC) guidelines
- Clearly established referral path and process to higher/specialized levels of care
- Clearly established patient transfer protocols
- Appropriate staff education for services delivered

Gestational Age	Maternal Care		Newborn Care
Level I	**Level Ia and Level Ib**		**Level I**
Greater than or equal to 36 weeks and 0 days	**Risk** • Low maternal and neonatal risk including no significant medical diseases or risk factors likely to impact pregnancy and not anticipated to experience any significant complications • Between 36 + 6 days and 36 + 0 days only if spontaneous preterm labour in absence of any other fetal maternal complications; in particular APH, hypertension, diabetes, any maternal infection or fever in labour greater than 38oC • For all other cases less than 37 weeks consultation or transfer is recommended • Operative vaginal deliveries should be undertaken only when there is a reasonable chance of success and a backup plan is in place (SOGC/MOREOB) **Support** • The goal, where possible, should be to provide human resources and supports needed for 24/7 anaesthesia coverage Labour analgesia should be available. This includes use of systemic narcotics (e.g., IM, IV, PCA), nitrous oxide with appropriate monitoring and safety protocols and labour epidural pain relief based on the availability of anaesthesia staff at the centre. Epidural services, where available, should follow established CAS/ASA guidelines for obstetrical anaesthesia. When a caesarean delivery is determined to be necessary and within scope of service, there must be timely access to anaesthetic and surgical services for the operative procedure. (Refer to SOGC guidelines).		**Expected skill level:** • Evaluation and postnatal care of healthy newborn infants who are predominantly cared for in a mother-baby dyad model (rooming-in) • Phototherapy • Manage, for a limited duration, term newborn complications such as transient tachypnea of the newborn (TTNB), antibiotic prophylaxis, hypoglycaemia, and feeding difficulties • Resuscitation and stabilization of ill infants before transfer to an appropriate care facility
	Level Ia	**Level Ib**	
	Does not provide caesarean delivery service 24/7/365 • Singleton pregnancies only • VBAC deliveries should not be offered • Informed consent should be documented regarding the availability of resources and procedures i.e. capacity to provide on-site caesarean birth.	• **Provides caesarean delivery service 24/7/365** • May care for uncomplicated dichorionic twin pregnancies greater than or equal to 36 weeks and 0 days • Capability for electronic fetal monitoring • Suspected SGA infants would not be delivered without consultation • Assessment and care by an anaesthesiologist or FP/GP anaesthetist for operative deliveries	

(Continued on next page)

Gestational Age	Maternal Care	Newborn Care
Level II *Greater than or equal to 34 weeks and 0 days*	**Level IIa** **Care as above PLUS:** **Risk** • Women carrying a fetus with anomalies (minor) not likely to need immediate interventions • Low-to-moderate maternal risk experiencing low risk medical/obstetrical complications where SGA is not suspected • May care for uncomplicated dichorionic twin pregnancies. If less than 36 weeks and 0 days consider consultation and transfer. **Support** • 24/7 induction and augmentation of labour • 24/7 availability of continuous EFM • Available assessment within 30 minutes by obstetrics, anaesthesia, and paediatrics for emergencies and potential caesarean sections	**Level IIa** **Care as above PLUS:** **Risk** • Planned/anticipated care for infants with a gestational age greater than or equal to 34 weeks and 0 days and a birth weight greater than 1800 grams **Illness and intervention** • Mild illness expected to resolve quickly • Care of stable infants who are convalescing after intensive care • Nasal oxygen with oxygen saturation monitoring (acute and convalescing) • Ability to initiate and maintain a peripheral intravenous • Gavage feeding **Retro-transfers** • Stable neonatal retro-transfers with a corrected age over 32 weeks and 0 days, and a weight greater than 1500 grams and not requiring invasive or non-invasive ventilation, or advanced treatments or investigations
Level IIb *Greater than or equal to 32 weeks and 0 days*	**Level IIb** **Care as above PLUS:** • May care for uncomplicated dichorionic twin pregnancies. If less than 34 weeks and 0 days consider consultation and transfer	**Level IIb** **Care as above PLUS:** **Risk** • Planned/anticipated care of infants with a gestational age greater than or equal to 32 weeks and 0 days and a birth weight greater than 1500 grams **Illness and interventions** • Moderately ill with problems expected to resolve quickly or who are convalescing after intensive care • Continuous Positive Airway Pressure (CPAP), either transitional or extended stable CPAP • May have mechanical ventilation for brief durations (less than 24 hours) • Insert and maintain umbilical lines • Maintenance of PICC lines • Peripheral intravenous infusions and total parenteral nutrition **Retro-Transfers** • Stable neonatal retro-transfers with a corrected over 30 weeks and 0 days, and over 1200 grams and not requiring invasive ventilation, subspecialty support, surgical support, advanced treatments and investigations

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Standards for maternity services in Ontario, Canada (4/9)

Gestational Age	Maternal Care	Newborn Care	
Level IIc	**Level IIc**	**Level IIC**	
Greater than or equal to 30 weeks and 0 days2	**Care as above PLUS:** **Risk** • Moderate maternal and/or neonatal risk • Delivery of infants with antenatally diagnosed non-life threatening fetal anomalies (following consultation with a MFM specialist and paediatrician) not requiring immediate intervention • May care for uncomplicated dichorionic or monochorionic twin pregnancies. If less than 32 weeks and 0 days gestation consider consultation and transfer • May care for uncomplicated triplets as expertise and capacity allows	**Care as above PLUS:** **Risk** • Planned/anticipated care of infants with a gestational age greater than or equal to 30 weeks and 0 days and a birth weight greater than 1200 grams. **See note below**[1] **Illness and intervention** • Moderately ill newborns with problems expected to resolve within a week or who are convalescing after intensive care • Mechanical ventilation for conditions expected to resolve within a week or extended continuous positive airway pressure • Intravenous infusion • Total parenteral nutrition • The ability to insert and maintain umbilical central lines • Maintenance of percutaneous intravenous central lines, access to PICC line insertion • Support of babies with extended mechanical ventilation and lower gestational age may be required as a result of temporary inability to transport (e.g. geography, weather, capacity) **Retro-transfers** • Retro-transfers should be reviewed on a case-by-case basis between the tertiary and receiving sites	
Level III	**Level III**	**Level IIIa**	**Level IIIb**

Any gestational age or weight	**Care as above PLUS:**
	• High Risk maternal and/or neonatal (newborn care requirements must be within the scope of the newborn program services and resources)
	• High maternal risk and/or complex medical, surgical and/or obstetrical complications requiring complex multidisciplinary and subspecialty critical care at any gestational age
	• High fetal risk complications such as diagnosis of congenital malformations that require access to
	  • Special fetal diagnostic or therapeutic procedures
	  • Paediatric subspecialty consultation or care
	  • Neonatal surgical services
	• Neonatal intensive care services as per Neonatal Scopes of Services document
	• On-site adult intensive care unit services available to accept transfer and care of unstable parturients
		Care as above PLUS:
		Risk
		• Any gestational age or weight
		• Mechanical ventilation support including high frequency, and possibly inhaled nitric oxide, for as long as required
		• Timely access to a comprehensive range of subspecialty consultants
			As in IIIa PLUS:
			• On site surgical capability.

NOTE: The gestational age and birth weight criteria of 30 weeks plus 0 days and greater than 1200 grams will be a change from usual practice for some IIC units and should only be implemented following a clinical trial to make sure that the outcomes are comparable to Level III care for the 30 to 32 week population. Until this evaluation has been completed the admission criteria for those IIC units currently functioning with 32 week 0 days as their admission criteria should remain at status quo.   Not having ROP screening service (on-site or remote) is a confining feature and a major obstacle to retro-transfer. Centres with limited coverage are encouraged to explore local or regional cross-coverage. At this point ROP screening as a "must have" for Level IIB has been removed

Standards for maternity services in Ontario, Canada (5/9)

Type of diagnostic test/treatment available	Maternal					
Minimum Standard for Level	**Level Ia**	**Level Ib**	**Level IIa**	**Level IIb**	**Level IIc**	**Level III**
Prenatal						
Routine antenatal screening access should be arranged for all pregnant women regardless of where they live	✓	✓	✓	✓	✓	✓
Electronic Fetal Monitoring	✓	✓	✓	✓	✓	✓
In labour						
Fetal Fibronectin (fFn)	✓	✓	✓	✓	✓	✓
Continuous Fetal Monitoring (external)		✓	✓	✓	✓	✓
Fetal Scalp pH Optional				Optional	Optional	Optional
Continuous O2 sat monitoring	✓	✓	✓	✓	✓	✓
Obstetrical ultrasound					✓	✓
Obstetrical interventions						
Induction of labour		✓	✓	✓	✓	✓
Operative vaginal delivery (forceps or vacuum)	✓[1]	✓[1]	✓	✓	✓	✓
Epidural[2]	[2]	[2]	✓	✓	✓	✓
Surgery, caesarean section		✓	✓	✓	✓	✓
ICU care on site						✓
Administer blood products	✓	✓	✓	✓	✓	✓
Post delivery						
D & C		✓	✓	✓	✓	✓

1 Excludes mid- cavity rotation
2 Where available for levels Ia and Ib

SOURCE: PCMCH, Standardized maternal and neonatal levels of care definitions, 2013 update

Type of Personnel						
Minimum Standard	**Level Ia**	**Level Ib**	**Level IIa**	**Level IIb**	**Level IIc**	**Level III**
Medical						
Family Physician/Midwife	✓	✓	✓	✓	✓	✓
GP Surgeon/General Surgeon/GP Obstetrical Surgeon		✓				
GP Anaesthetist/ Anaesthesiologist		✓	✓			
Obstetrician			✓	✓	✓	✓
Anaesthesiologist				✓	✓	✓
Maternal Fetal Medicine Specialist						✓
Nursing						
Registered Nurse * As per FCMNG	✓	✓	✓	✓	✓	✓
Registered Practical Nurse	Optional	Optional	Optional	Optional	Optional	Optional
Respiratory Therapy						
Registered Respiratory Therapist			✓	✓	✓	✓
Other Staffing Support						
Pharmacist			✓	✓	✓	✓
Social Worker			✓	✓	✓	✓
Dietician			✓	✓	✓	✓
Spiritual Care/Bereavement Support	✓	✓	✓	✓	✓	✓
Ultrasonography Technicians		✓	✓	✓	✓	✓
Radiology Technicians		✓	✓	✓	✓	✓
Lactation Support /Consultant	✓	✓	✓	✓	✓	✓
Specialist Consultations						
Antenatal Paediatric Consultations			✓	✓	✓	✓
Antenatal Neonatal Subspecialists Consultations						✓
Cardiology						✓
Clinical Genetics						✓
Radiology		✓	✓	✓	✓	✓
Internal Medicine			✓	✓	✓	✓
Psychiatry					✓	✓

NOTE: Availability of personnel should be consistent with the model of care within the organization and the normal work schedule for the particular professional group

SOURCE: PCMCH, Standardized maternal and neonatal levels of care definitions, 2013 update

Type of Diagnostic Test	Newborn Care						
Minimum Standard	**Level I**	**Level IIa**	**Level IIb**	**Level IIc**	**Level IIIa**	**Level IIIb**	**Accessibility**
General Laboratory							
Micro technique for neonates - all routine blood work and newborn screening	✓	✓	✓	✓	✓	✓	
Blood type & Coombs	✓	✓	✓	✓	✓	✓	
Cross match	✓	✓	✓	✓	✓	✓	
Bacterial smear	✓-Regional	✓	✓	✓	✓	✓	
Bacterial and viral studies	✓	✓	✓	✓	✓	✓	Regional
Drug screen	✓	✓	✓	✓	✓	✓	Regional
Metabolic screen (serum AA, urine AA and OA, ammonia, lactate)		✓	✓	✓	✓	✓	Regional
Therapeutic drug monitoring		✓	✓	✓	✓	✓	Regional
Umbilical cord blood pH	✓	✓	✓	✓	✓	✓	
Continuous O_2 sat monitoring	✓	✓	✓	✓	✓	✓	
Pathology					✓	✓	
Other Diagnostics							
Echocardiography					✓–Timely Access	✓- 24/7	
EEG					✓–Timely Access	✓–Timely Access	
Infant eye exams (retinopathy)			See note below[1]	✓	✓	✓	

NOTE: A YES for testing or services indicates 24/7/365 availability, If otherwise indicated, testing and or services should be consistent with the normal model of care and work schedule of personnel i.e. Monday-Friday and/or timely access for technologist.

1 Not having a screening service (on-site or remote) is a confining feature and a major obstacle to retro- transfer. Centres with limited coverage are encouraged to explore local or regional cross-coverage. At this point ROP screening as a "must have" for Level IIb have been removed.

Type of Treatment	Newborn						
Minimum Standard	Level I	Level IIa	Level IIb	Level IIc	Level IIIa	Level IIIb	Accessibility
Treatment							
Gavage feeding		✓	✓	✓	✓	✓	
Lumbar puncture		✓	✓	✓	✓	✓	
Phototherapy	✓	✓	✓	✓	✓	✓	
Short term O2 stabilization	✓	✓	✓	✓	✓	✓	
Long term O2 therapy -convalescent		✓	✓	✓	✓	✓	
Continuous positive airway pressure management			✓	✓	✓	✓	
Endotracheal intubation (prior to transfer)	✓	✓	✓				
Ventilation support < 24 hours			✓	✓	✓	✓	
Ventilation support < 7 days				✓	✓	✓	
Ventilation support unlimited					✓	✓	
Administration of surfactant (prior to transfer)		✓	✓	✓	✓	✓	
Drainage of pneumothorax prior to transfer	✓	✓	✓	✓	✓	✓	
Chest tube initiation and maintenance				✓	✓	✓	
Short term IV stabilization	✓	✓	✓	✓	✓	✓	
Long term IV therapy (greater than 1 week)			✓	✓	✓	✓	
Catheterization of umbilical vein and/or artery	✓	✓	✓	✓	✓	✓	
Umbilical central line maintenance			✓	✓	✓	✓	
Percutaneous IV central line maintenance			✓	✓	✓	✓	
PICC line insertion				✓-timely access	✓	✓	
Arterial puncture			✓	✓	✓	✓	
Administer blood products	✓-prior to	✓	✓	✓	✓	✓	
TPN			✓	✓	✓	✓	
Full range of non-invasive and invasive procedures/treatments/ monitoring for tertiary care					✓	✓	
Infant surgery						✓	
Neonatal Follow-Up				✓-access	✓	✓	

(Continued on next page)

Note: A YES for testing or services indicates 24/7/365 availability, If otherwise indicated, testing and or services should be consistent with the normal model of care and work schedule of personnel i.e. Monday-Friday and/or timely access for technologist.

1 Not having a screening service (on-site or remote) is a confining feature and a major obstacle to retro- transfer. Centres with limited coverage are encouraged to explore local or regional cross-coverage. At this point ROP screening as a "must have" for Level IIb have been removed.

Type of Personnel						
Minimum Standard	**Level Ia**	**Level Ib**	**Level IIa**	**Level IIb**	**Level IIc**	**Level III**
Medical: MRP						
Family Physician/Midwife	✓	✓				
Paediatrician		✓	✓	✓		
Neonatologist				Access to	✓	✓
Nursing						
Registered Nurse	✓	✓	✓	✓	✓	✓
Registered Practical Nurse	Optional	Optional	Optional	Optional	Optional	Optional
Respiratory						
Registered Respiratory Therapist		✓-on call	✓-on call	✓-in house	✓-in house	✓-in house
Other Staffing Support						
Social Worker		✓	✓	✓	✓	✓
Feeding and Developmental Assessments (Physiotherapy or Occupational Therapist)				✓	✓	✓
Dietician			✓	✓	✓	✓
Pastoral Care/Bereavement Support	✓	✓	✓	✓	✓	✓
Ultrasonography Techs for cranial ultrasounds			Weekdays	Weekdays	✓-on call	✓-on call
Radiology Techs	✓-on call	✓-on call	✓	✓	✓	✓
Pharmacist		✓-on call	✓-on call	✓-on call	✓-on call	✓-on call
Clerical Staff	✓	✓	✓	✓	✓	✓
Subspecialties (access to):						
Antenatal Consult for Inborn Units		✓	✓	✓	✓	✓
Neonatal surgery						✓
Anaesthesia						✓
Paediatric Cardiology					✓	✓
Radiology	✓	✓	✓	✓	✓	✓
Ophthalmology			[1] See note below	✓	✓	✓

Note: Availability of personnel should be consistent with the model of care within the organization and the normal work schedule for the particular professional group
1 Not having a screening service (on-site or remote) is a confining feature and a major obstacle to retro- transfer. Centres with limited coverage are encouraged to explore local or regional cross-coverage. At this point ROP screening as a "must have" for Level IIb have been removed.

Minimum standards for maternity units in Stockholm

Evidence source	Guidance
Regelbok för förlossningsenheter, 2013 (Swedish language publication) http://www.vardgivarguiden.se/global/03_avtal-uppdrag/v%C3%A5rdval%20stockholm/f%C3%B6rlossningsenheter/rb%20forlossning%202013.pdf	**Rule Book for Maternity Units – issued by Stockholm County Council** **Summary of standards** - The provider is responsible for ensuring that there are enough competent resources to handle high-risk pregnancies and deliveries 24/7 - Each unit has to have an experienced specialist in obstetrics/gynecology available 24 hours that can be called in within 30 minutes - Primary care with emergency function 24 hours and specialized care for women with complications - Ability to handle all kinds of deliveries - Primary and secondary post-natal care - Location in direct connection (i.e. in the same building or building complex) with neonatal care, anesthesia, intensive care and surgery with 24-hour availability - Joint beds for post-surgical care for the mother and child - Blood services - Medical services - Chemical laboratory for basic analysis 24 hours and extended analysis during day-time - Microbiological laboratory for basic analysis 24 hours and extended analysis during day-time - Specialist in urology/surgery for assistance in complicated surgery - Neonatal specialist doctor that can be called in within 30 minutes 24-hour access to other necessary specialists such as infection, internal medicine, coagulation diseases and psychiatry - Emergency priest (or similar)

Standards for maternity services in France

Evidence source	Guidance
Haute Autorite de Sante, Qualité et sécurité des soins dans le secteur de naissance: Guide méthodologique, 2014 (in French) http://www.has-sante.fr/portail/upload/docs/application/pdf/2014-03/guide_qualite_securite_secteur_naissance.pdf	**Summary of requirements**

Summary of requirements

Volume of deliveries/year	Workforce requirements
<500	24/7 presence of midwife who may have other (non-delivery suite) assigned duties if no delivery is in progress
<500	Paramedic assigned to the area of birth who may have other assigned duties if no delivery is in progress
>500	24/7 presence of midwife (with no concurrent duties outside of the delivery unit) plus 1 additional midwife FTE for each additional 200 births above 1,000
>500	Paramedic assigned to the area of birth (with no concurrent duties)
>2,500	1 additional midwife in supervisory role
<1,500	24/7 obstetrician (surgically qualified) and anaesthetist on site or on call and available in 20 minutes
1,500-2,000	24/7 obstetrician (surgically qualified) presence (in unit) and 24/7 anaesthetist on site (not necessarily in unit)
>2,000	24/7 obstetrician (surgically qualified) and anaesthetist presence in unit
All sizes	Paediatrician available on site 24/7

	Dependent services requirements
All units	Obstetric surgery including emergency surgery and abdomino-pelvic surgery relating to pregnancy and childbirth requiring general or regional/local anaesthesia
All units	Room equipped for care of the newborn including capability to resuscitate two children at a time (devices required is set by the Ministry of Health)
<1,200	Operating theatre may not be located in the area of birth provided it is in the same health facility
>1,200	Operating theatre and post-surgical observation room must be within or adjacent to the delivery area

Evidence source	Guidance
Rules and Regulations for Hospitals and Related Institutions in Arkansas, Department of Health, 2007 http://www.healthy.arkansas.gov/aboutADH/Pages/RulesRegulations.aspx 	**Hospital requirements relating to intrapartum maternity services** **A. Labor Room and/or LDR, LDRP Room.** 1. Provisions shall be made for patients in labor in either a designated labor room and/or birthing room. Rooms used only for labor shall be in close proximity to the delivery room. Furniture, washable wallpaper, pictures, radio, television and other items may be used as long as the needs of the mother and baby are not compromised. Items selected shall be made of durable materials, with a smooth, impervious surface which can be easily cleaned and disinfected. 2. All beds used for labor shall be equipped with side rails. 3. There shall be equipment and supplies available for the examination and preparation of patients in labor, which shall consist of the following: a. Precipitous delivery tray; b. Stethoscope; c. Suction equipment; d. Sterile gloves; e. Emergency medications as approved by the Pharmacy and Therapeutics Committee and supplies to include laryngoscopes, airways, endotracheal tubes and infant ambu bags; and f. Fetal monitoring device. 4. A physician shall be immediately available when Oxytocin is administered. "Immediately available" shall be determined by the hospital's administrative staff, Medical Staff and Governing Body. 5. Father or support persons may be allowed with the patient during labor unless medically contraindicated. **B. Delivery Areas.** 1. Hospitals offering delivery and maternity services shall comply with the requirements of this Section. (See Section 14, Health Information Services and Section 11, Patient Care Service.) 2. General operating rooms may not be used for deliveries, except for major surgical deliveries. Delivery rooms shall be separate from operating rooms and shall not be used for any other purpose, with the exception of a tubal ligation immediately following a delivery. Delivery rooms may be used for Caesarean sections provided the usual operating room equipment is used, and surgical policies and procedures related to the delivery are made a part of the labor and delivery manual. 3. The following equipment and supplies shall be provided: a. Supply of medications as approved by the Pharmacy and Therapeutics Committee; *(continued on next page)*

Note: See also regulations pertaining to free-standing birthing centres (not summarised here). Link as above.

Evidence source	Guidance
Rules and Regulations for Hospitals and Related Institutions in Arkansas, Department of Health, 2007 http://www.healthy.arkansas.gov/aboutADH/Pages/RulesRegulations.aspx	*(continued from previous page)* b. Infant identification and supplies. Identification shall be done in the delivery room at the time of birth and shall remain in place during the entire period of hospitalization. Identification information shall be sufficient to identify the infant(s) with one mother. Identification bands shall be waterproof plastic with tag inserts written in waterproof ink; c. Heated bassinet, crib or incubator; d. Supply of prophylaxis medication for the prevention of infant blindness. The medication shall be administered within one and one-half hours of the time of birth per written order of the physician; e. Commercially manufactured delivery table/birthing bed with a waterproof non-conductive table pad; f. Side tables for instruments and other necessary equipment; g. Approved surgical light; h. Wall clock; i. Equipment and supplies for timed scrub technique and an approved disinfectant soap; j. Apgar score chart; k. Suction equipment (infant and adult); l. Sphygmomanometer; and m. Fetal monitoring device. **C. Organization.** 1. Delivery services shall be under the direction of a qualified physician and under the supervision of a Registered Nurse. A Registered Nurse shall be present during labor, delivery and post delivery of each patient. The birth shall be attended by a physician or a certified nurse midwife with hospital privileges. 2. Patients shall be provided with direct care by a Registered Nurse during labor, delivery, recovery and postpartum. a. All patients in active labor shall be attended and/or monitored. b. Qualified nurses, in adequate numbers shall be provided to meet the needs of each patient. 3. An on-call schedule shall be provided to ensure that a physician with obstetrical privileges is readily available to perform obstetrical services at all times. "Readily available" shall be determined by the hospital's administrative staff, Medical Staff and Governing Body. 4. Qualified Registered Nurses shall always be available in-house for labor and delivery patients. When there are no patients, on-call staff may be utilized if approved by the Medical Staff and Governing Body. 5. Procedures for obtaining the mother's Rh factor shall be provided by the facility or documented by the mother's attending physician upon admission. 6. When a patient presents to the hospital for evaluation, the physician shall be notified. *(continued on next page)*

Standards for intrapartum maternity services in Arkansas (3/5)

Evidence source	Guidance
Rules and Regulations for Hospitals and Related Institutions in Arkansas, Department of Health, 2007 http://www.healthy.arkansas.gov/aboutADH/Pages/RulesRegulations.aspx	*(continued from previous page)* 7. Policies and procedures shall include: a. Immediate delivery; b. Obstetrical emergencies; c. Setting up and cleaning the delivery room, LDR or LDRP room and Csection room; d. Equipment requirements; e. Visitation; f. Climate control (physical); g. Infection control measures; h. Aseptic techniques; i. Intermittent rooming in; j. Anesthesia; k. Deliveries occurring outside the delivery area; l. Infectious patients; and m. Infant security. 8. A permanent record of all deliveries shall be maintained. There shall be a reasonable attempt to collect current information to include the following: a. Mother's name, date of birth, maiden name, father's name if available, hospital number, gravida-para, ABO type, Rh factor and length of gestational period; and b. Baby's sex, race, date of birth, time of birth, weight, apgar score and baby identification band number. **D. Anesthesia.** 1. Only a physician, anesthesiologist or Certified Registered Nurse Anesthetist (CRNA) shall be permitted to initiate and reinject continual epidural or caudal anesthesia and to initiate or continue general or regional anesthesia. 2. A physician shall be immediately available if CRNAs are administering anesthesia. "Immediately available" shall be determined by the hospital's administrative staff, Medical Staff and Governing Body. 3. The permanent record shall contain the names of the physician, anesthesiologist, anesthetist or CRNA. **E. Postpartum Care.** 1. Policies and procedures shall be developed specific to the care of maternity patients. 2. Maternity patients shall not be routinely cared for in rooms with patients admitted for diagnosis other than maternity. 3. After an observation period, the infant may stay in the room with the mother for the duration of the hospital stay. *(continued on next page)*

Evidence source	Guidance
Rules and Regulations for Hospitals and Related Institutions in Arkansas, Department of Health, 2007 http://www.healthy.arkansas.gov/aboutADH/Pages/RulesRegulations.aspx	*(continued from previous page)* 4. Mothers with infection, fever or other condition that could adversely affect the safety and welfare of others shall be immediately segregated and isolated in a separate room. **F. Maternal-Child Education.** The hospital shall develop an educational program for the care of the obstetrical patient and infant. Policies and procedures shall include: 1. Personal hygiene; 2. Dietary instruction; 3. Care of episiotomy and perineum; 4. Care of incision; 5. Breast care; 6. Exercise program; 7. Car seat safety (Arkansas State Law); 8. Preventive health; 9. Referral services; and 10. Infant care. **Standard requirements for post-partum nursery services** The newborn nursery shall be under the direct supervision of a Registered Nurse with clinical skills in newborn nursing. The newborn nursery shall be located within or adjacent to the postpartum unit. The following requirements shall apply to all nurseries: A. Nurseries shall not be used for any other purpose and shall never be left unattended when occupied. B. Infants born outside the hospital or with proven or potential infections shall be isolated from other infants in the Nursery. Infants with infections, skin rash or diarrhea shall be immediately separated and isolated. C. Isolettes shall not serve as a sole means of isolation. Provisions for isolation shall be provided. D. The following equipment shall be provided in nurseries: 1. Individual approved type hospital bassinets. Wicker or woven type bassinets shall not be used; 2. Metal or approved plastic diaper and waste containers. The lids on these containers shall be operated by a foot control or equivalent device; 3. Infant scales; 4. Blankets and linen; 5. Suction equipment; and *(continued on next page)*

Evidence source	Guidance
Rules and Regulations for Hospitals and Related Institutions in Arkansas, Department of Health, 2007 http://www.healthy.arkansas.gov/aboutADH/Pages/RulesRegulations.aspx	*(continued from previous page)* 6. Incubators suitable for the care of premature infants provided in the ratio of at least one incubator to 20 bassinets. E. Infant emergency supplies: 1. Emergency medications approved by the Pharmacy and Therapeutics Committee; 2. Infant laryngoscope; 3. Suction catheters; 4. Endotracheal tubes; 5. Stylets; and 6. Infant airways and IV supplies. F. Strict hand hygiene techniques shall be maintained by all personnel . A clean barrier shall be used by anyone handling the infant. G. Infant clothing shall be furnished by the hospital; however, if the mother wishes to provide clothing for the infant, hospital personnel shall examine the clothing to make sure it meets hospital requirements. Diapers shall be available in necessary quantities. H. Formula Feedings. 1. Any individually packaged, presterilized formula delivered by an outside source shall be approved by the facility. 2. There shall be an adequate supply of sterile disposable ready-to-use formula bottles available. 3. Formulas shall be stored in enclosed cabinets. 4. The expiration date shall be checked on each bottle prior to infant feeding. 5. Policies and procedures shall be developed in conjunction with the Infection Control Committee regarding the handling, labeling and storing (separately) of breast milk. 6. Individual nipple shields and breast pumps used in infant feeding shall be cleaned according to hospital infection control policies and procedures. 7. If the facility has a breast milk bank the policies and procedures shall be submitted to and approved by the Arkansas Department of Health and hospital Infection Control Committee. I. Rooming-In Service. Hospitals providing a newborn nursery may provide rooming in for infants on an intermittent or 24 hour basis based on the mother's request

Stroke standards – Australia (1/2)

Evidence source	Guidance
Stroke Foundation (2010) Clinical guidelines for stroke management (http://strokefoundation.com.au/site/media/clinical_guidelines_stroke_managment_2010_interactive.pdf)	**Stroke unit care** – All people with stroke should be admitted to hospital and be treated in a stroke unit with a multidisciplinary team. – All people with stroke should be admitted directly to a stroke unit (preferably within three hours of stroke onset). – Smaller hospitals should consider stroke services that adhere as closely as possible to the criteria for stroke unit care. Where possible, patients should receive care on geographically discrete units. – If people with suspected stroke present to non-stroke unit hospitals, transfer protocols should be developed and used to guide urgent transfers to the nearest stroke unit hospital. **Ongoing inpatient rehabilitation** – To ensure all stroke patients receive early, active rehabilitation by a dedicated stroke team, health systems should have comprehensive services which include and link the fundamentals of acute and rehabilitation care. – Patients should be transferred to a stroke rehabilitation unit if ongoing inpatient rehabilitation is required. – If a stroke rehabilitation unit is not available, patients who require ongoing inpatient rehabilitation should be transferred to a conventional rehabilitation unit where staff have stroke-specific expertise. – All patients, including those with severe stroke, who are not receiving palliative care should be assessed by the specialist rehabilitation team prior to discharge from hospital regarding their suitability for ongoing rehabilitation. **Inpatient stroke care coordinator** – An inpatient stroke care coordinator should be used to coordinate services and assist in discharge planning. **Telemedicine and networks** – All health services which include regional or rural centres caring for stroke patients should use networks which link large stroke specialist centres with smaller regional and rural centres. – These networks should be used to help establish appropriate stroke services along with protocols governing rapid assessment, telestroke services and rapid transfers. – Where no on-site stroke medical specialists are available, telestroke consultation should be used to assess eligibility for acute stroke therapies and/or transfer to stroke specialist centres. – Telestroke can be used to improve assessment and management of rehabilitation where there is limited access to on-site stroke rehabilitation expertise. **Transient ischaemic attack** – All patients with suspected TIA presenting to a general practitioner or emergency department should be rapidly assessed. – Those identified as high risk (e.g. ABCD[2] score >3 and/or those with any one of the following: AF, carotid territory symptoms or crescendo TIA, should be admitted to a stroke unit (or where available referred to a specialist TIA clinic if the person can be assessed within 24 hours) to facilitate rapid specialist assessment and management. – Those identified as low risk (e.g. ABCD[2] score <4 and without AF or carotid territory symptoms or crescendo TIA should commence initial therapy (e.g. aspirin) and then be managed in the community by a general practitioner or private specialist or, where possible, be referred to a specialist TIA clinic and seen within seven days. **Team meetings** – The multidisciplinary stroke team should meet regularly (at least weekly) to discuss assessment of new patients, review patient management and goals, and plan for discharge. (Continued on next page)

Stroke standards – Australia (2/2)

Evidence source	Guidance
Stroke Foundation (2010) Clinical guidelines for stroke management (http://strokefoundation.com.au/site/media/clinical_guidelines_stroke_managment_2010_interactive.pdf)	(Continued from previous page)

(Continued from previous page)

- **Transient ischaemic attack**
  - All patients with suspected TIA should have a full assessment that includes a detailed history and clinical, prognostic (e.g. $ABCD^2$ score) and investigative tests (e.g. blood tests, brain and carotid imaging and ECG) at the initial point of healthcare contact, whether first seen in primary or secondary care.
  - Patients identified as high risk (e.g. $ABCD^2$ score >3 and/or any one of AF, carotid territory symptoms or crescendo TIA should undergo:
    - Urgent brain imaging (preferably MRI with DWI), 'urgent' being immediately where available, but within 24 hours)
    - Carotid imaging should also be undertaken urgently in patients with anterior circulation symptoms who are candidates for carotid re-vascularisation. In settings with limited access to these investigations, referral within 24 hours should be made to the nearest centre where such tests can be quickly conducted.
  - Patients classified as low-risk (e.g. $ABCD^2$ score <4 without AF or carotid territory symptoms or who present more than one week after last symptoms should have brain and carotid imaging (where indicated) as soon as possible (i.e. within 48 hours).
  - The following investigations should be undertaken routinely for all patients with suspected TIA: full blood count, electrolytes, erythrocyte sedimentation rate (ESR), renal function, lipid profile, glucose level, and ECG.
- **Rapid assessment in the emergency department**
  - Initial diagnosis should be reviewed by a clinician experienced in the evaluation of stroke.
  - Emergency department staff should use a validated stroke screening tool to assist in rapid accurate assessment for all people with stroke.
  - Stroke severity should be assessed and recorded on admission by a trained clinician using a validated tool (e.g. nIHSS or SSS).
- **Imaging**
  - All patients with suspected stroke should have an urgent brain CT or MRI ('urgent' being immediately where facilities are available but within 24 hours). Patients who are candidates for thrombolysis should undergo brain imaging immediately.
  - A repeat brain CT or MRI and acute medical review should be considered urgently when a patient's condition deteriorates.
  - All patients with carotid territory symptoms who would potentially be candidates for carotid re-vascularisation should have urgent carotid imaging.
  - Further brain, cardiac or carotid imaging should be undertaken in selected patients:
    - Where initial assessment has not identified the likely source of the ischaemic event
    - With a history of more than one TIA
    - Likely to undergo carotid surgery.
- **Thrombolysis**
  - Intravenous rt-PA should be given as early as possible in carefully selected patients with acute ischaemic stroke as the effect of thrombolysis is time-dependent.
  - Where possible, therapy should commence in the first few hours but may be used up to 4.5 hours after stroke onset.
  - Intravenous rt-PA should only be given under the authority of a physician trained and experienced in acute stroke management.

Designation criteria for stroke units in Germany

Evidence source	Guidance
Swiss Archives of Neurology and Psychiatry (2011) Current concepts of stroke units in Germany and Europe (http://www.sanp.ch/docs/2011/2011-04/2011-04-110.PDF)	- In Germany, two types of Stroke Unit are distinguished: - The "regional Stroke Unit", which would best be translated as a "primary stroke centre" (PSC) on the international level, serves most stroke patients of a given catchment area. It is mostly located in primary or secondary hospitals. To gain the official certification as a "regional Stroke Unit" of the German Stroke Society, the absolute minimum is 250 patients per year treated in a minimum of four beds in any PSC. It is planned to increase the absolute minimum number to 300 patients per stroke unit per year. For units with more than 4 beds, a minimum of 80 patients per year and per bed are suggested. - The "überregionale Stroke Unit" is similar to the "comprehensive stroke Centre" (CSC) on the international European level. A minimum of 450 patients per year need to be treated at this facility, and the minimum number of beds is 6. It is planned to increase the minimum number of patients to 100 per bed and year for the official certification by the German Stroke Society. CSCs need to maintain neurosurgery, vascular surgery and neuroradiology on a 24/7 basis. - A recent hospital survey from Germany showed that 663 patients were treated on average in a comprehensive stroke centre (CSC, "überregionale Stroke Unit") and 448 patients were treated on average in a primary stroke centre (PSC, "regional Stroke Unit"). The percentage of patients being treated with thrombolysis was 7.6% in CSCs and 6.8% in PSCs, compared with 3.3% on average in Europe. At present, only 4 out of approximately 200 certified Stroke Units in Germany are run by internists, and the others are run by neurologists. Those Stroke Units not run by neurologists have to ensure there is permanent neurological expertise on-site by hiring two full-time neurologists with stroke expertise in order to be eligible for certification.

Key components of German Stroke Units.

Two variants of stroke units are certified: "Regionale Stroke Units" (primary stroke center, PSC) and "Überregionale Stroke Units" (comprehensive stroke center, CSC)

- Minimum of 6 (CSC) and 4 (PSC) stroke beds in a dedicated area.
- Every bed is capable of automated multimodal monitoring (blood pressure, breathing, temperature, ECG, heart rate, oxygen saturation).
- Special beds for patients with severe strokes or unstable conditions that need longer expert supervision (enhanced care concept).

Absolutely necessary are:

- Intensive care unit in-house available, CT available 24/7, multi-professional stroke team.
- Only stroke patients treated on stroke units.
- Access to a neurosurgeon.
- Availability of any angiographic method (DSA, MRA, CTA) and vascular ultrasound 24/7. Availability of echocardiography.

In "Überregionale Stroke Units", MRI. neurosurgery In-house and invasive neuroradiology must be available

- Intravenous rt-PA protocols 24/7.
- Minimum of 80 stroke patients per bed per year.
- Stroke trained physicians 24/7.

"Überregionale Stroke Units", must be located In neurological departments

- High personnel resources: Überregionale Stroke Units: 2 nurses/bed, Regionale Stroke Units: 1.5 nurses/bed.
- Daily availability of physiotherapy, ergotherapy, speech therapy including dysphagia screening and therapy.
- Social worker.
- Availability of neuropsychological competence.

Delivery of benchmarking data of every patient in a centrally located data base of the German Stroke Registers Study (ADSR) Group and reporting every 6 months.

Continuous training in-house and for emergency services, public education and GP5.

Establishment of a referral concept for the emergency services (to deliver the right patient to the right Institution).

The certification process is subject to an audit performed according to a predefined check list.

Stroke guidelines in the US

Evidence source	Guidance
Stroke (2013) Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association (*http://stroke.ahajournals.org/content/44/3/870.full*)	▪ The creation of Primary Stroke Centres (PSCs) is recommended. The organization of such resources will depend on local resources. The stroke system design of regional Acute Stroke-Ready Hospitals (ASRHs – hospitals that have made an institutional commitment to effectively and efficiently evaluate, diagnose, and treat most ED stroke patients but do not have fully organized inpatient stroke systems of care) and PSCs that provide emergency care and that are closely associated with a Comprehensive Stroke Centre (CSC – a centre which should be able to offer 24/7 care on the full spectrum of cerebrovascular disease), which provides more extensive care, has considerable appeal. ▪ Certification of stroke centers by an independent external body, such as The Joint Commission (TJC) or state health department, is recommended. Additional medical centers should seek such certification. ▪ Healthcare institutions should organize a multidisciplinary quality improvement committee to review and monitor stroke care quality benchmarks, indicators, evidence-based practices, and outcomes. The formation of a clinical process improvement team and the establishment of a stroke care data bank are helpful for such quality of care assurances. The data repository can be used to identify the gaps or disparities in quality stroke care. Once the gaps have been identified, specific interventions can be initiated to address these gaps or disparities. ▪ For patients with suspected stroke, EMS should bypass hospitals that do not have resources to treat stroke and go to the closest facility most capable of treating acute stroke. ▪ For sites without in-house imaging interpretation expertise, teleradiology systems approved by the Food and Drug Administration (FDA) or equivalent organization are recommended for timely review of brain CT and MRI scans in patients with suspected acute stroke. ▪ When implemented within a telestroke network, teleradiology systems approved by the FDA (or equivalent organization) are useful in supporting rapid imaging interpretation in time for fibrinolysis decision making. ▪ The development of CSCs is recommended. ▪ Implementation of telestroke consultation in conjunction with stroke education and training for healthcare providers can be useful in increasing the use of intravenous recombinant tissue-type plasminogen activator (rtPA) at community hospitals without access to adequate onsite stroke expertise. ▪ The creation of ASRHs can be useful. As with PSCs, the organization of such resources will depend on local resources. The stroke system design of regional ASRHs and PSCs that provide emergency care and that are closely associated with a CSC, which provides more extensive care, has considerable appeal.

Stroke standards in Canada (1/4)

Evidence source	Guidance
Canadian Stroke Network (2009) Canadian stroke strategy: a guide to the implementation of stroke unit care – a resource for implementation of Canadian best practice recommendations for stroke care (http://strokebestpractices.ca/wp-content/uploads/2010/11/CSS-Stroke-Unit-Resource_EN-Final2-for-print.pdf)	**Acute stroke unit care** – A stroke unit is a specialized, geographically defined hospital unit dedicated to the management of stroke patients. – The core interdisciplinary team should consist of clinicians with appropriate levels of expertise in medicine, nursing, occupational therapy, physiotherapy, speech–language pathology, social work and clinical nutrition. Additional disciplines may include pharmacy, (neuro)psychology and recreation therapy. – The interdisciplinary team should assess patients within 48 hours of admission and formulate a management plan. – Clinicians should use standardized, valid assessment tools to evaluate the patient's stroke-related impairments and functional status. – Any child admitted to hospital with stroke should be managed in a centre with pediatric stroke expertise and/or managed using standardized pediatric stroke protocols. **Provision of inpatient stroke rehabilitation** – Post–acute stroke care should be delivered in a setting in which rehabilitation care is formally coordinated and organized. – All patients should be referred to a specialist rehabilitation team on a geographically defined unit as soon as possible after admission/ Pediatric acute and rehabilitation stroke care should be provided on a specialized pediatric unit. – Post–acute stroke care should be delivered by a variety of treatment disciplines, experienced in providing post stroke care, to ensure consistency and reduce the risk of complications . – The interdisciplinary rehabilitation team may consist of a physician, nurse, physical therapist, occupational therapist, speech–language pathologist, psychologist, recreation therapist, patient and family/caregivers. For children, this would also include educators and child-life workers. This "core" interdisciplinary team should consist of appropriate levels of these disciplines, as identified by the Stroke Unit Trialists' Collaboration. – The interdisciplinary rehabilitation team should assess patients within 24 to 48 hours of admission and develop a comprehensive individualized rehabilitation plan which reflects the severity of the stroke and the needs and goals of the – stroke patient. – Patients with moderate or severe stroke who are rehabilitation ready and have rehabilitation goals should be given an opportunity to participate in inpatient stroke rehabilitation. – Stroke unit teams should conduct at least one formal interdisciplinary meeting per week to discuss the progress and problems, rehabilitation goals and discharge arrangements for patients on the unit. Individualized rehabilitation plans should be regularly updated based on patient status reviews. – Clinicians should use standardized, valid assessment tools to evaluate the patient's stroke-related impairments and functional status. – Where admission to a stroke rehabilitation unit is not possible, a less optimal solution is inpatient rehabilitation on a mixed rehabilitation unit (i.e., where interdisciplinary care is provided to patients disabled by a range of disorders including stroke). (Continued on next page)

Stroke standards in Canada (2/4)

Evidence source	Guidance

Canadian Stroke Network (2009) Canadian stroke strategy: a guide to the implementation of stroke unit care – a resource for implementation of Canadian best practice recommendations for stroke care (http://strokebestpractices.ca/wp-content/uploads/2010/11/CSS-Stroke-Unit-Resource_EN-Final2-for-print.pdf)	(Continued from previous page)
	
	▪ **Definitions of level of stroke services within acute care and rehabilitation facilities**
	— **Comprehensive stroke centres** are centres with specialized resources and personnel available at all times (24 hours a day, 365 days a year) to provide assessment and management of stroke patients. These facilities have established written stroke protocols for emergency services, in-hospital care and rehabilitation; the ability to offer thrombolytic therapy to suitable ischemic stroke patients; timely neurovascular imaging and expert interpretation; and coordinated processes for patient transition to ongoing rehabilitation, secondary prevention and community reintegration services. Comprehensive stroke centres also include neurosurgical facilities and interventional radiology services. Comprehensive stroke centres have a leadership role in establishing partnerships with other local hospitals for supporting stroke care services. These centres may also be referred to as 'regional stroke centres' in some jurisdictions.
	— **Hospitals with intermediate stroke services** are facilities with clinicians who have stroke expertise; written stroke protocols for emergency services, acute care and/or rehabilitation; ability to offer thrombolytic therapy to suitable ischemic stroke patients or protocols to transfer appropriate patients to a comprehensive stroke centre; timely neurovascular imaging and timely access to expert interpretation (e.g., telemedicine); and coordinated processes for patient transition to ongoing rehabilitation and secondary prevention services.
	— **Hospitals without specialized stroke resources** are centres that do not have in-hospital resources such as clinicians with stroke expertise or neuroimaging. These centres should have written agreements in place to facilitate timely transfer of stroke patients to centres with stroke specific levels of care as appropriate.
	
	▪ **Models of stroke unit care**
	— The Canadian Stroke Strategy defines three models of stroke unit care within the Canadian Best Practice Recommendations for Stroke Care (2008): integrated stroke units, acute care stroke units and rehabilitation stroke units.
	— **An integrated stroke unit** provides both acute and rehabilitation care to patients during their inpatient stays following a stroke. The patient also remains on the same unit for an extended period of time – usually beyond the first seven days of an acute care inpatient stay. The following elements would be considered key components of an integrated stroke unit:
	  ▫ A specialized, geographically defined hospital unit dedicated to the management of stroke patients.
	  ▫ A dedicated core interprofessional team which includes neurology, nursing, occupational therapy, physiotherapy, speech-language pathology, social work, physiatry, and clinical nutrition (and possibly internal medicine, pharmacy and (neuro)psychology etc). The team has a special interest in stroke and advanced training in stroke management.
	  ▫ Patients should move to the Stroke Unit as soon as possible, ideally within 3 hours of presentation to the ED.
	  ▫ Patients will receive both their acute medical care and rehabilitation on the same ward/unit from an interprofessional team experienced in the care of stroke patients.
	  ▫ The interprofessional team should assess patients and formulate a management plan within 24- 48 hours of admission.
	  ▫ Clinicians use standardized, valid assessment tools to evaluate the patient's impairments and functional status.
	  ▫ Comprehensive, evidence based, written protocols, order sets and care pathways/algorithms should be in place to guide acute stroke care and rehabilitation.
	  ▫ Shared decision making and goal setting involves the treating team, patients, and carers
	  ▫ Interprofessional team meetings will be held at least once per week to review all stroke patients.
	  ▫ Patient and carer education are an important component of acute and post acute stroke care.
	(Continued on next page)

Stroke standards in Canada (3/4)

Evidence source	Guidance
Canadian Stroke Network (2009) Canadian stroke strategy: a guide to the implementation of stroke unit care – a resource for implementation of Canadian best practice recommendations for stroke care (http://strokebestpractices.ca/wp-content/uploads/2010/11/CSS-Stroke-Unit-Resource_EN-Final2-for-print.pdf)	(Continued from previous page) – **An acute stroke unit** provides acute and initial rehabilitation care to stroke patients during the acute phase following a stroke. This has been reported in the research literature as the first 7 to 10 days following a stroke event. This period may be longer for hemorrhagic stroke patients. An acute stroke unit provides acute care as well as early rehabilitation. Patients requiring longer term rehabilitation may be transferred to another location within the same facility, to a stroke rehabilitation unit in another facility, or to a specialized rehabilitation facility to receive ongoing rehabilitation according to their needs. The following elements would be considered key components of an acute stroke unit: ▫ A specialized, geographically defined hospital unit dedicated to the management of stroke patients during the first 7 – 10 days (may be longer) following an acute stroke event. ▫ A dedicated core interprofessional team which includes medicine, nursing, occupational therapy, physiotherapy, speech-language pathology, social work, physiatry, and clinical nutrition (and possibly pharmacy, (neuro)psychology etc). The team has a special interest in stroke and advanced training in stroke management. ▫ Patients should move to the Stroke Unit as soon as possible, ideally within 3 hours of presentation to the ED. ▫ Patients will receive both their acute medical care and early rehabilitation from an experienced interprofessional team. ▫ The interprofessional team should assess patients and formulate a management plan within 24- 48 hours of the acute admission, including an assessment of the patient's rehabilitation needs. ▫ Clinicians use standardized, valid assessment tools to evaluate the patient's impairments and functional status. ▫ Comprehensive, evidence based, written protocols, order sets and care pathways/algorithms should be in place. ▫ Shared decision making and goal setting involves the treating team, patients, and carers. ▫ Interprofessional team meetings will be held once per week to review all stroke patients. ▫ Patient and carer education are an important component of acute and post acute stroke care. – **A stroke rehabilitation unit** provides stroke care to patients during the post-acute recovery phase following a stroke. Patients are usually transferred to a stroke rehabilitation unit once they are medically stable (based on individual unit admission criteria). A stroke rehabilitation unit may exist within a general hospital or in a separate specialized rehabilitation facility. The length of stay on a stroke rehabilitation unit has been reported on average from 3 to 6 weeks. The goal of stroke rehabilitation units is to maximize the stroke client's potential for recovery so that they may be able to function at the highest level of physical and mental ability they can achieve post stroke. The following elements would be considered key components of a stroke rehabilitation unit: ▫ A specialized, geographically defined rehabilitation unit dedicated to the rehabilitation of stroke patients. ▫ A dedicated core interprofessional team which includes physiatry, nursing, occupational therapy, physiotherapy, speech-language pathology, social work, and clinical nutrition (and possibly internal medicine, pharmacy and (neuro)psychology etc). The team has a special interest in stroke and advanced training in stroke management. ▫ Patients should move to the stroke rehabilitation unit as soon as possible, ideally within 5 days of stroke onset. (Note: hemorrhagic stroke patients may require more time in acute care before transfer to rehab care). ▫ The interprofessional team should assess patients and formulate a management plan within 24- 48 hours of admission. ▫ Clinicians use standardized, valid assessment tools to evaluate the patient's impairments and functional status. ▫ Comprehensive, evidence based, written protocols, order sets and care pathways/algorithms should be in place. ▫ Interprofessional team meetings will be held once per week to review all stroke patients. ▫ Shared decision making and goal setting involves the treating team, patients, and carers.

Stroke standards in Canada (4/4)

Evidence source	Guidance

Canadian Stroke Network (2010) Canadian stroke strategy: Canadian best practice recommendations for stroke care – update 2010 (http://www.strokebestpractices.ca/wp-content/uploads/2011/04/2010BPR_ENG.pdf)	• A stroke unit is a specialized, geographically defined hospital unit dedicated to the management of stroke patients and staffed by an interprofessional team.
	 • Patients admitted to hospital because of an acute stroke or transient ischemic attack should be treated on an interprofessional stroke unit.
	   – Patients should be admitted to a stroke unit which is a specialized, geographically defined hospital unit dedicated to the management of stroke patients.
	   – The core interprofessional team on the stroke unit should consist of healthcare professionals with stroke expertise from medicine, nursing, occupational therapy, physiotherapy, speech-language pathology, social work, and clinical nutrition (dietitian). Additional disciplines may include pharmacy, (neuro) psychology, and recreation therapy.
	   – The interprofessional team should assess patients within 48 hours of admission to hospital and formulate a management plan.
	   – Clinicians should use standardized, valid assessment tools to evaluate the patient's stroke-related impairments and functional status.
	   – Any child admitted to hospital with stroke should be managed in a centre with paediatric stroke expertise and/or managed using standardized paediatric stroke protocols.
	 • All patients with stroke who are admitted to hospital and who require rehabilitation should be treated in a comprehensive or rehabilitation stroke unit by an interprofessional team.
	   – Post–acute stroke care should be delivered in a setting in which rehabilitation care is formally coordinated and organized.
	   – All patients should be referred to a specialist rehabilitation team on a geographically defined unit as soon as possible after admission [Evidence Level A]. Paediatric acute and rehabilitation stroke care should be provided on a specialized paediatric unit.
	   – The interprofessional rehabilitation team should consist of a physician, nurse, physical therapist, occupational therapist, speech-language pathologist, psychologist, recreation therapist, patient, and family and/or caregivers. For children, this should also include educators and child-life workers. This core interprofessional team should consist of appropriate levels of these disciplines, as identified by the Stroke Unit Trialists' Collaboration.

Evidence source	Guidance

Royal College of Physicians (2012) National clinical guideline for stroke (http://www.rcplondon.ac.uk/sites/default/files/national-clinical-guidelines-for-stroke-fourth-edition.pdf)	(Continued from previous page).
	— Alteplase should only be administered within a well-organised stroke service with:
	  ▫ Staff trained in the delivery of thrombolysis and monitoring for post-thrombolysis complications
	  ▫ Nurse staffing levels equivalent to those required in level 1 or level 2 nursing care with staff trained in acute stroke and thrombolysis
	  ▫ Immediate access to imaging and re-imaging, and staff appropriately trained to interpret the images
	  ▫ Processes throughout the emergency care pathway for the minimisation of inhospital delays to treatment, to ensure that thrombolysis is administered as soon as possible after stroke onset
	  ▫ Protocols in place for the management of post-thrombolysis complications.
	— Emergency medical staff, if appropriately trained and supported, can administer alteplase for the treatment of acute ischaemic stroke provided that patients can be managed within an acute service with appropriate neuroradiological and stroke physician support.
	— Intra-arterial interventions should only be used in the context of a clinical trial.
	— Perfusion scanning, eg to determine suitability for thrombolysis in patients where time of onset is unknown or where the patient presents beyond 4.5 hours, should only be used in the context of research trials.
	— Every patient treated with thrombolysis should be started on an antiplatelet after 24 hours, unless contraindicated (eg after significant haemorrhage has been excluded).
	— All people presenting with acute stroke who have had the diagnosis of primary intracerebral haemorrhage excluded by brain imaging should, as soon as possible but certainly within 24 hours, be given:
	  ▫ An antiplatelet orally if they are not dysphagic
	  ▫ An antiplatelet rectally or by enteral tube if they are dysphagic.
	  ▫ Thereafter aspirin 300 mg should be continued until 2 weeks after the onset of stroke, at which time definitive long-term antithrombotic treatment should be initiated. People being discharged before 2 weeks can be started on long-term treatments earlier.
	— Any person with acute ischaemic stroke for whom previous dyspepsia associated with an antiplatelet is reported should be given a proton pump inhibitor in addition to aspirin.
	— Anticoagulation should not be used routinely for the treatment of acute ischaemic stroke.
	— People with middle cerebral artery (MCA) infarction who meet all of the criteria defined below should be considered for decompressive hemicraniectomy. They should be referred within 24 hours of onset of symptoms and treated within a maximum of 48 hours:
	  ▫ Aged 60 years or under
	  ▫ Clinical deficits suggestive of infarction in the territory of the middle cerebral artery
	  ▫ A score on the National Institute of Health Stroke Scale (NIHSS) of above 15
	  ▫ A decrease in the level of consciousness to a score of 1 or more on item 1a of the NIHSS
	  ▫ Signs on CT of an infarct of at least 50% of the MCA territory with or without additional infarction in the territory of the anterior or posterior cerebral artery on the same side, or infarct volume greater than 145 cubic centimetres as shown on diffusion-weighted MRI.
	(Continued on next page)

Stroke best practice insights (22/33)

Evidence source	Guidance
Royal College of Physicians (2012) National clinical guideline for stroke (http://www.rcplondon.ac.uk/sites/default/files/national-clinical-guidelines-for-stroke-fourth-edition.pdf)	(Continued from previous page). – People who are considered for decompressive hemicraniectomy should be monitored by appropriately trained professionals skilled in neurological assessment. – Stroke services should agree protocols for monitoring, referral and transfer of patients to regional neurosurgical centres for the management of symptomatic hydrocephalus. – Immediate initiation of statin treatment is not recommended in people with acute stroke. – People with acute stroke who are already receiving statins should continue their statin treatment. **Immediate management of intracerebral haemorrhage** – Clotting levels in people with a primary intracerebral haemorrhage who were receiving anticoagulation with a vitamin K antagonist (eg warfarin) before their stroke, should be returned to a normal international normalised ratio (INR) as soon as possible, by reversing the effects of the warfarin/vitamin K antagonist treatment using a combination of prothrombin complex concentrate and intravenous vitamin K. – People with an intracerebral haemorrhage should be monitored by specialists in neurosurgical or stroke care for deterioration in consciousness level and referred immediately for brain imaging when necessary. – People should be considered for surgical intervention following primary intracranial haemorrhage if they have hydrocephalus. – People with any of the following rarely require surgical intervention and should receive medical treatment initially: ▫ Small deep haemorrhages ▫ Lobar haemorrhage without either hydrocephalus or rapid neurological deterioration ▫ A large haemorrhage and significant prior comorbidities before the stroke ▫ Supratentorial haemorrhage with a Glasgow Coma Score of less than 8 unless this is because of hydrocephalus **Immediate diagnosis and management of subarachnoid haemorrhage** – Every patient presenting with sudden severe headache and an altered neurological state should have the possible diagnosis of subarachnoid haemorrhage investigated by: ▫ Immediate CT brain scan ▫ Lumbar puncture between 12 hours and 14 days if the CT brain scan is negative and does not show any contraindication ▫ Spectrophotometry of the cerebrospinal fluid for xanthochromia. – Every patient diagnosed as having a subarachnoid haemorrhage should be referred immediately to a tertiary neuroscience centre and: ▫ Be started on oral nimodipine 60 mg 4 hourly unless there are specific contraindications ▫ Not be given anti-fibrinolytic agents or steroids. – In the specialist service the patient should have: ▫ CT angiography (if this has not been done by agreed protocol in the referring hospital) with or without catheter angiography to identify the site of bleeding ▫ Specific treatment of any aneurysm related to the haemorrhage by endovascular embolisation or surgical clipping if appropriate. Treatment to secure the aneurysm should be available within 48 hours of ictus, especially for good grade patients. (Continued on next page)

Evidence source	Guidance

Royal College of Physicians (2012) National clinical guideline for stroke (http://www.rcplondon.ac.uk/sites/default/files/national-clinical-guidelines-for-stroke-fourth-edition.pdf)	(Continued from previous page).
	  – After any immediate treatment, all patients should be observed for the development of treatable complications, especially hydrocephalus and delayed cerebral ischaemia.
	  – Every patient who survives should be assessed for treatable risk factors (ie hypertension and smoking), and have these treated.
	  – Every patient who survives and has any residual symptoms or disability should be referred for, and transferred to, specialist rehabilitation as soon as possible after definitive treatment.
	  – Every patient with a strong family history of two or more affected first-degree relatives and/or a history of polycystic renal disease should:
	    ▫ Be advised that their family may be at increased risk of subarachnoid haemorrhage
	    ▫ Be considered for a referral to a neurovascular and/or neurogenetic specialist for up-to-date information and advice.
	  – Patients with subarachnoid haemorrhage with focal neurological signs should receive their rehabilitation in a stroke specialist service.
	■ Initial early rehabilitation assessment
	  – All patients should be assessed within a maximum of 4 hours of admission for their:
	    ▫ Ability to swallow, using a validated swallow screening test (eg 50 ml water swallow) administered by an appropriately trained person
	    ▫ Immediate needs in relation to positioning, mobilisation, moving and handling
	    ▫ Bladder control
	    ▫ Risk of developing skin pressure ulcers
	    ▫ Capacity to understand and follow instructions
	    ▫ Capacity to communicate their needs and wishes
	    ▫ Nutritional status and hydration
	    ▫ Ability to hear, and need for hearing aids
	    ▫ Ability to see, and need for glasses.
	  – All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within 5 working days, and this should be documented in the notes.
	■ Early mobilisation
	  – Every patient with reduced mobility following stroke should be regularly assessed by an appropriately trained healthcare professional to determine the most appropriate and safe methods of transfer and mobilisation.
	  – People with acute stroke should be mobilised within 24 hours of stroke onset, unless medically unstable, by an appropriately trained healthcare professional with access to appropriate equipment.
	  – People with stroke should be offered frequent opportunity to practise functional activities (e.g., getting out of bed, sitting, standing, and walking) by an appropriately trained healthcare professional.

Evidence source	Guidance
Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments (https://www.acem.org.au/getattachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx)	• An Emergency Department ED must have the following basic elements: – Must operate structurally and functionally within a hospital – 24 hour dedicated nursing staff with a dedicated Nurse Unit Manager or equivalent – Daily rostered medical staff and 24 hours a day, seven days a week access to medical staff after hours – Dedicated facilities to manage emergency presentations – Co-located dedicated resuscitation area with appropriate equipment to provide advanced paediatric, adult and trauma life support prior to transfer to definitive care – 24 hour access to blood products – 24 hour access to laboratory and radiology services – 24 hour access to specialty care or advice – 24 hour access to retrieval services, as appropriate – If there are no emergency specialists (Fellows of ACEM (FACEMs)) on staff then the Emergency Department must be part of an Emergency Medicine Network. • **Level 1 Emergency Department:** A Level 1 Emergency Department will provide emergency care within a designated area of a remote or rural hospital. It is the minimum level of service that can be defined as an Emergency Department. – Design: The Emergency Department must be purpose built area to receive and manage emergency presentations with monitoring and resuscitation equipment. There may be other areas designed to manage less acute presentations. – Service description: The emergency caseload for a Level 1 Emergency Department may be intermittent. Basic primary and secondary assessment should be available including advanced paediatric, adult and trauma life support and stabilisation of critically ill patients prior to arrival of the retrieval service. A Level 1 Emergency Department will have 24 hour access to specialty advice. – Service Requirements: In a Level 1 Emergency Department, triage should occur on arrival by credentialed clinical staff using the Australasian Triage Scale (ATS). A Level 1 Emergency Department should be part of a regional Emergency Medicine Network through which it can access emergency specialist support, advice and training. – Workforce: ▫ Medical: Medical staff with a basic level of emergency medicine training are available 24 hours a day, seven days a week. Medical staff should be on-site at least within working hours and weekend days and should be available at short notice (within 10 minutes of any phone call). There should be a Director of the Emergency Department, a FACEM or a generalist with an ACEM Emergency Medicine Diploma, who is supported by specialists in an Emergency Medicine Network. ▫ Nursing: Nursing staff with basic training in emergency care should be dedicated to the Emergency Department and on-site 24 hours a day, seven days a week. Nurses should be credentialed in triage. – Support services: ▫ Plain radiology available on-site ▫ Pathology – point of care testing available on-site and access to more advanced pathology tests ▫ 24 hour access to emergency specialist (FACEM) advice by telephone, tele-health and/or referral hospital outreach ▫ Access to secondary services such as surgery, medicine, orthopaedics, paediatrics, and obstetrics and gynaecology (access includes advice by telephone, tele-health, and referral hospital outreach service) ▫ Access to a 24 hour retrieval service. (Continued on next page)

Evidence source	Guidance
Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments ([https://www.acem.org.au/get attachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx](https://www.acem.org.au/getattachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx))	(Continued from previous page) ▪ **Level 2 Emergency Department:** A Level 2 Emergency Department will be part of a secondary hospital with capabilities of managing some complex cases, and would offer some sub-specialty services. This level of service should be able to provide primary critical care. – Design: A Level 2 Emergency Department must be purpose built (with a separate resuscitation area) with capabilities for managing patients with life threatening conditions, including capacity for invasive monitoring and short term assisted ventilation. There must be additional areas for the assessment and management of the range of acute presentations and casemix, to ensure safe and high quality care. The number and type of assessment and management areas must be commensurate with the demand and caseload. A dedicated short stay unit or equivalent area may be in place. In Emergency Departments that receive paediatric patients, there must be a dedicated area for the assessment and management for this group. – Service description: A Level 2 Emergency Department must be able to manage the complete range of emergency presentations, and be capable of providing a level of service for the community that is commensurate with the provision of primary emergency care. It will be part of an Emergency Medicine Network and if emergency specialist (FACEM) led may be at the hub of that network. The Emergency Department must have the capability of transferring critically ill patients, and have access to a retrieval service. There must be a capability for the key participation in response to local major incidents. This includes a role in a formal Disaster Response Plan. The Emergency Department should participate in undergraduate and postgraduate training and education. There should also be evidence of some involvement in research. Emergency Department staff should participate in hospital committees and quality improvement processes. – Service requirements: ▫ There is a clinical information management system which records presentation details, clinical information and data for clinical indicators ▫ There is adequate physical capacity and type of spaces available for management of patients in relation to acuity and access to in-patient and alternative services ▫ Risk management strategies are developed, implemented and evaluated ▫ Documented processes to guide clinical management, including paediatrics and obstetrics/gynaecology, where appropriate ▫ Documented processes for the management of mental health patients including risk management strategies specific to this group are in place ▫ Formal quality improvement programs including mortality and morbidity reviews and evaluation of clinical indicators are in place ▫ Quality improvement data is submitted to an independent review process such as Australian Council on Healthcare Standards (ACHS). (Continued on next page)

Evidence source	Guidance
Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments ([https://www.acem.org.au/get attachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx](https://www.acem.org.au/getattachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx))	(Continued from previous page)

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- Workforce:
  - Medical: A FACEM as Director, supported by emergency specialist staff (FACEMs), or by senior medical staff should be available seven days per week, with on call cover 24 hours a day, seven days a week, commensurate with casemix and patient load. For Emergency Departments accredited by ACEM for training, a Director of Emergency Medicine Training (DEMT) and preferably a person responsible for clinical training of junior medical staff and medical students should be employed. Medical officers at least Post Graduate Year (PGY) Level 4 should have a 24 hours a day, seven day a week on-site presence and adequate clinical supervisory support should be in place.
  - Nursing: A Nurse Unit Manager or equivalent, a nurse responsible for nurse education and Advanced Skills Clinical Nurses (where applicable), supported by experienced and qualified clinical registered nurses (RNs) and 24 hours a day, seven days a week team leaders/shift coordinators. A dedicated 24 hour clinical triage service should be present.
  - Allied health: Access to social worker(s), clinical pharmacist(s), physiotherapist(s), occupational therapist(s), Indigenous Liaison Worker(s) and Aged Care/community/specialty nurse resources.
  - Administrative and service support staff: Administrative and service support staff should be on-site seven days a week. Evaluation of workforce requirements should include the level of training, expertise, seniority mix, educational and training access and minimum standards required for both service delivery and supervision.
- Support services available on-site:
  - Radiology
  - Pathology
  - Pharmacy services
  - General surgical services
  - Anaesthetics
  - Critical care – Coronary Care Unit (CCU)/High Dependency Unit (HDU)/Intensive Care Unit (ICU) – depending on local network arrangements
  - General medicine
  - Obstetrics and gynaecology, where applicable
  - Paediatrics - mixed departments or access to a paediatric centre.
- Access to:
  - Surgical sub-specialties including neurosurgery, plastic surgery, vascular, orthopaedics, ear, nose and throat (ENT), ophthalmology 24 hours a day, seven days a week
  - Medical sub-specialties including (but not restricted to) respiratory, gastroenterology, cardiology, endocrinology, haematology and oncology 24 hours a day, seven days a week
  - Higher level critical care services
  - Tertiary level paediatric service
  - Mental health services
  - Community services
  - Alcohol and drug dependency services.

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Evidence source	Guidance
Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments (https://www.acem.org.au/get attachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx)	(Continued from previous page)

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- **Level 3 Emergency Department:** It would be expected that EDs at this level would be part of a major regional, metropolitan or urban hospital with capabilities of managing most complex cases and have some sub-specialty services.
  - Design: In addition to Level 2 specification, there should be more than one resuscitation bay or room, separate monitored areas and a dedicated and operational Emergency Department Short Stay Unit in place.
  - Service description: A Level 3 Emergency Department should be able to manage the complete range of emergency presentations and be capable of providing a level of service for the community that is commensurate with the provision of primary emergency care. It should support other regional emergency centres as part of an Emergency Medicine Network. The Emergency Department must have the capability of transferring critically ill patients and have access to a retrieval service. There must be a capability for key participation in response to local major incidents. This includes a role in a formal Disaster Response Plan. The Emergency Department must participate in emergency medicine training, and undergraduate and postgraduate training. Additionally, the Emergency Department should have formal education programs for nursing, medical and allied health staff and students. There should also be evidence of active involvement in research. Emergency Department staff should participate in hospital committees and quality improvement processes.
  - Service requirements
    - There is a clinical information management system which records presentation details, clinical information and data for clinical indicators
    - There is adequate physical capacity and type of spaces available for management of patients in relation to acuity and access to in-patient and alternative services
    - Risk management strategies are developed, implemented and evaluated
    - Documented processes to guide clinical management including paediatrics and obstetrics/gynaecology, where appropriate
    - Documented processes for the management of mental health patients including risk management strategies specific to this group are in place
    - Formal quality improvement programs, including mortality and morbidity reviews and evaluation of clinical indicators are in place
    - Quality improvement data is submitted to an independent review process such as ACHS.
  - Workforce
    - Medical: One FACEM qualified director, supported by FACEM qualified specialist staff, with on-site presence 16 x 7, commensurate with casemix and patient load. A DEMT and a person responsible for the clinical training of junior medical staff and medical students must be in place. On-site 24 hours a day, seven days a week advanced and/or provisional trainees and/or medical officers at PGY level 4 with adequate clinical supervisory support in place.
    - Nursing: A dedicated Nurse Unit Manager or equivalent, Clinical Nurse Educator(s), Advanced Skills Clinical Nurses (where applicable) supported by experienced and qualified clinical RNs and 24 hours a day, seven days a week team leaders/shift coordinators.
    - Allied health: Dedicated departmental social worker(s).
    - Access to the following: clinical emergency pharmacist, physiotherapist(s), occupational therapist(s), Indigenous Liaison Workers and Aged Care/community nurse/ specialty(s).
    - Administrative and service support staff: 24 hours a day, seven days a week administrative and service support staff.

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Evidence source	Guidance

Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments (https://www.acem.org.au/getattachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx)	(Continued from previous page)
	  – Support services available on site:
	    ▫ Radiology
	    ▫ Pathology
	    ▫ Pharmacy services
	    ▫ General surgical services
	    ▫ Orthopaedics
	    ▫ Anaesthetics
	    ▫ Critical care – Intensive Care Unit (ICU), Coronary Care Unit (CCU) or High Dependency Unit (HDU)
	    ▫ General medicine
	    ▫ Medical sub-specialties
	    ▫ Obstetrics and gynaecology 24 hours a day, seven days a week, where applicable
	    ▫ Paediatrics in mixed departments
	    ▫ Allied health
	    ▫ Mental health services (not necessarily on-site but readily accessible)
	    ▫ Community services.
	  – Access to:
	    ▫ Surgical sub-specialties including neurosurgery, plastic surgery, vascular, ear, nose and throat (ENT), ophthalmology
	    ▫ Tertiary level paediatric service
	    ▫ Tertiary level critical care services
	    ▫ Tertiary level medical sub-specialties
	    ▫ Alcohol and drug dependency service.
	▪ **Level 4 Emergency Department:** It would be expected that Emergency Departments at this level are part of a large, multifunctional tertiary or major referral hospital with capabilities for managing a wide range of complex conditions, and have a significant level of sub-specialty services.
	  – Design: A Level 4 Emergency Department must be purpose built with separate multiple resuscitation areas with the capability to manage patients with major trauma and/or life threatening conditions, including capacity for invasive monitoring and short term assisted ventilation. There must be additional areas for the assessment and management for the range of acute and complex presentations and casemix to ensure safe and high quality care, including mental health. The number and type of assessment and management areas must be commensurate with the demand and caseload. This will include a dedicated Emergency Department Short Stay Unit and areas capable of extended monitoring and assessment. In departments which receive paediatric patients, there must be a dedicated area for assessment and management for this group, including a dedicated resuscitation area.
	  – Service description: A Level 4 Emergency Department must be able to manage the complete range of emergency presentations and be capable of providing tertiary level support for other more regional centres as part of a clinical or jurisdictional healthcare network. The Emergency Department must have a dedicated retrieval service or access to one. There must be a capability for the key participation in a trauma service or trauma network. This includes a role within a formal Disaster Response Plan. The Emergency Department will be accredited for emergency medicine training and actively participate in undergraduate and post graduate training and formal education
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Emergency department standards in Australia (6/7)

Evidence source	Guidance
Australasian College for Emergency Medicine (2012) Statement on the delineation of emergency departments ([https://www.acem.org.au/get attachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx](https://www.acem.org.au/getattachment/541e19cd-6e5e-48b2-93f6-7416c43ac13a/Statement-on-the-Delineation-of-Emergency-Departme.aspx))	(Continued from previous page) – Service requirements: There is a clinical information management system which records presentation details, clinical information and data for clinical indicators. ▫ There is adequate physical capacity available for the management of patients in relation to acuity and access to in-patient and alternative services ▫ Risk management strategies are developed, implemented and evaluated ▫ Documented processes to guide clinical management, including paediatrics and obstetrics/gynaecology, where appropriate and documented processes for the management of mental health patients including risk management ▫ Formal quality improvement programs and evaluation of clinical indicators are in place ▫ Quality improvement data is submitted to an independent review process such as ACHS. – Workforce: ▫ Medical: One Full Time Equivalent (FTE) FACEM director and deputy director or equivalent, supported by FACEM qualified specialist staff on-site 16 x 7 and available 24 hours a day, seven days a week on-call, commensurate with casemix and patient load. Additionally, the Emergency Department must have a dedicated DEMT and a person responsible for the clinical training for junior medical staff and medical students. On-site 24 hours a day, seven days a week advanced Emergency Medicine trainees with adequate clinical supervisory support. ▫ Nursing: A dedicated Nurse Unit Manager or equivalent, Clinical Nurse Educators, Advanced Skills Clinical Nurses (where applicable) supported by experienced and qualified clinical RNs and 24 hours a day, seven days a week team leaders/shift coordinators. ▫ Allied health: Dedicated social worker(s), clinical emergency pharmacist, physiotherapist(s), occupational therapist(s), Indigenous Liaison Worker(s), Discharge Planner, and Aged Care/community/specialty nurse(s) at least on-site or immediately available for extended hours. ▫ Administrative and service support staff: 24 hours a day, seven days a week administrative and service support staff. Evaluation of workforce requirements should include the level of training, expertise, seniority mix, educational and training access and minimum standards required for both service delivery and supervision. – Support services available on site: ▫ Radiology including interventional radiology ▫ Pathology ▫ Pharmacy services ▫ General surgical services and general medicine ▫ Orthopaedics and Trauma service ▫ Surgical sub-specialties including neurosurgery, plastic surgery, vascular, ear, nose and throat (ENT), ophthalmology ▫ Anaesthetics and critical care – Intensive Care Unit (ICU) and Coronary Care Unit (CCU) ▫ Cardiology including on-site invasive cardiology laboratory ▫ Medical sub-specialties including (but not restricted to) respiratory, gastroenterology, endocrinology, neurology, haematology and oncology ▫ Obstetrics and gynaecology 24 hours a day, seven days a week (where applicable) ▫ Paediatrics in mixed departments ▫ Allied health, mental health services and community services – Access to: Alcohol and drug dependency services and tertiary level paediatric service.

Emergency department standards in Australia (7/7)

Evidence source	Guidance
Australasian College for Emergency Medicine (2007) Guidelines on emergency department design (https://www.acem.org.au/getattachment/b5807692-cba0-48b2-a277-d7ee8445eb4e/Emergency-Department-Design.aspx)	**Total size** – The total internal area of the emergency department, excluding observation ward and internal medical imaging area if present, should be at least $50m^2$/1000 yearly attendances or $145m^2$/1000 yearly admissions, whichever size is greater. The minimum size of a functional emergency department that can incorporate all of the major areas is $700m^2$. These figures are based upon access block being minimal. Emergency Departments may take extended amounts of time from conception to completion, therefore allowances for future growth and development must be made in the design process. – The total size and number of treatment areas will also be influenced by factors such as: patient numbers, casemix and activity; projected population growth and changing population demographics; anticipated changes in technology; laboratory and medical imaging turnaround time; inpatient bed accessibility; and staffing number and structure. **Total number of treatment areas** – The total number of patient treatment areas should be at least 1/1100 yearly attendances or 1/400 yearly admissions, whichever is greater in number. Areas such as procedure, plaster and interview rooms are not considered as treatment areas nor are holding bays or observation unit beds for admitted patients. The number of resuscitation areas should be no less than 1/15,000 yearly attendances or 1/5,000 yearly admissions and at least 1/2 of the total number of treatment areas should have physiological monitoring.

Emergency department standards in the US

Evidence source	Guidance
Accreditation Council for Graduate Medical Education (2012) Frequently asked questions: emergency medicine (https://www.acgmeweb.org/acgmeweb/Portals/0/PDFs/FAQ/110_emergency_medicine_FAQs_07012013.pdf)	▪ The Review Committee recommends that the Emergency Department should have one treatment room for every 2000 visits, and a minimum of 120 square feet for every individual patient care space. Each treatment room should be approximately 500 gross square feet (including walls, hallways, staff stations, etc.). ▪ As an example, an Emergency Department with 40,000 annual patient visits should have 20 treatment rooms with a total of 10,000 square feet. ▪ Rapid emergency rooms (ERs) (fast track or urgent care) should have one treatment room for every 4000 patient visits.

American College of Emergency Physicians (2007) Emergency Department Planning and Resource Guidelines (http://www.acep.org/content.aspx?id=29208)	▪ Emergency departments must possess the staff and resources necessary to evaluate all individuals presenting to the emergency department (ED). Emergency departments must also be able to provide or arrange treatment necessary to attempt to stabilize emergency patients who are found to have an emergency medical condition. Because of the unscheduled and episodic nature of health emergencies and acute illnesses, experienced and qualified physician, nursing, and ancillary personnel must be available 24 hours a day to serve those needs.
	 ▪ Emergency departments also provide treatment for individuals whose health needs are not of an emergency nature, but for whom EDs may be the only accessible or timely entry point into the broader health care system. Accessing an ED for care is an option exercised by patients seeking quality and service availability.
	 ▪ The American College of Emergency Physicians (ACEP) believes that:
	   – Emergency medical care must be available to all members of the public.
	   – Access to appropriate emergency medical and nursing care must be unrestricted.
	   – A smooth continuum should exist among prehospital providers, ED providers, and providers of definitive follow-up care.
	   – Evaluation, management, and treatment of patients must be appropriate and expedient.
	   – Resources should exist in the ED to accommodate each patient from the time of arrival through evaluation, decision making, treatment, and disposition.
	   – EDs should have policies and plans to provide effective administration, staffing, facility design, equipment, medication, and ancillary services.
	   – The emergency physician, emergency nurse, and additional medical team members are the core components of the emergency medical care system. These ED personnel must establish effective working relationships with other health care providers and entities with whom they must interact.
	   – These include emergency medical services (EMS) providers, ancillary hospital personnel, other physicians, and other health care and social services resources.