

SESLHD PROCEDURE COVER SHEET



Health
South Eastern Sydney
Local Health District

NAME OF DOCUMENT	Subgaleal haemorrhage following assisted vaginal birth or second stage caesarean section - early detection and management
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FUNCTIONAL GROUP(S)	Nursing and Midwifery Women's and Babies
KEY TERMS	Vacuum extraction, forceps, instrumental delivery, urgent, assisted vaginal birth, second stage caesarean section, subgaleal haemorrhage, cephalhaematoma, observations, hypovolaemia
SUMMARY	A guide to additional scalp observations and appropriate referral pathways for newborn infants at risk of subgaleal haemorrhage.

COMPLIANCE WITH THIS DOCUMENT IS MANDATORY

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Subgaleal haemorrhage following assisted vaginal birth or second stage caesarean section - early detection and management**SESLHDPR/414****1. POLICY STATEMENT**

Subgaleal (or subaponeurotic) haemorrhage (SGH) is a potentially lethal condition in newborn infants. It is most frequently associated with a vacuum assisted birth. It can also occur following normal vaginal birth, forceps delivery and caesarean section. The onset of clinical features can be insidious, therefore careful monitoring, observations and documentation and urgent action are critical to escalation and management. Further information on SGH can be searched and accessed from the landing page link below.

[Royal Australian and New Zealand College of Obstetricians and Gynaecologists \(RANZCOG\). \(C-Obs 28. November 2021\).](#)

2. BACKGROUND

SGH is the result of bleeding into the large space between the epicranial aponeurosis and the periosteum, caused by rupture of the emissary veins (which are connections between the dural sinuses and scalp veins). It most frequently occurs following assisted vaginal birth, particularly with vacuum assisted births. The majority of SGH's can be detected within the first hour of birth, the average time to diagnosis is 1-6 hours following birth.

Symptomatic SGH is an emergency and may be life threatening due to haemorrhagic shock. Careful monitoring, early recognition and urgent management where appropriate is required. The newborn infant may require resuscitation, urgent correction of hypovolemia, anaemia, coagulopathy with fluids and massive transfusion products. SGH Perinatal Practice Guideline can be searched and accessed from the landing page link. [Perinatal Practice Guidelines | SA Health](#).

Minimising the morbidity and mortality of SGH requires a multifaceted approach, with the engagement of obstetricians, birthing suite and postnatal midwives, special care unit/nursery and paediatric staff.

3. RESPONSIBILITIES**3.1 Midwifery and Nursing Staff and Medical Staff will:**

- Ensure familiarity with this procedure and any related local business rules.

3.2 Line Managers and Co-Directors will:

- Ensure that staff are familiar with the Local Health District policies and procedures and the requirement for adherence.

4. PROCEDURE**4.1 Observations in the Birthing suite and Postnatal ward after an assisted vaginal birth or second stage caesarean section following attempted assisted vaginal birth.**

- Paired umbilical cord blood gases should be collected for fetal blood gas analysis post birth.
- Ensure that intramuscular (IM), vitamin K was given within the hour following birth.
- If consent for IM vitamin K is declined, parents should be counselled by a paediatrician about all risks, including the risk of SGH. If IM vitamin K is still declined, obtain the parents signature on "Disclaimer for declining of neonatal vitamin K" form SES020.200 as per appendix A
- Always inspect for boggy swelling of the scalp, especially at the cup site.
- Always palpate the posterior scalp for a ballotable mass or movement of fluid in scalp, noting colour and head shape including displacement of ears or pitting oedema.
- Observations include: activity (for any lethargy), colour (for any pallor), capillary refill (for capillary refill >3 secs), temperature (for any hypothermia <36.5°C), heart rate (for any tachycardia >160/min) and respiration (for any tachypnoea >60/min and / or laboured breathing).

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- Document all observations on the Standard Newborn Observation Chart (SNOC) or eRIC.
- Avoid hats and bonnets (or remove frequently) so that changing head shape or size is noted.
- Newborn infants should be transferred to postnatal ward if SGH is not suspected. Scalp observations and palpation and head circumference will continue as per SNOC.

Detection and management**Level 1**

Who: All newborn infants after an assisted vaginal birth or second stage caesarean section following attempted vacuum or forceps who do not meet level 2 criteria

- Observations at birth, 1, 2, 4, 6, 8, 12 and 24 hours of age including:
 - Colour, temperature, heart rate, respiration rate, head circumference and scalp palpation.

Level 2

Who: All newborn infants where abnormalities in are noted on Level 1 surveillance **or**, assisted vaginal births with one or more of the following:

- total vacuum extraction time >20 minutes and/or
- 3 pulls and/or
- 2 cup detachments, or
- 5-minute Apgar <7
- Notify paediatric staff.
- Collect paired cord gases for pH, lactate, haematocrit and platelet count.
- Observations at birth; 1, 2, 4, 6, 8, 12 and 24 hours of age and more frequently if clinically indicated including:
 - Activity, colour, temperature, heart rate, respiration, head circumference and scalp palpation.
- A pulse oximeter should be used to accurately record the heart rate
- If abnormalities are noted on level 2 surveillance, the newborn infant should commence Level 3 surveillance.

Level 3

Who: For all newborn infants where there is a clinical suspicion of SGH immediately after birth and newborn infants with abnormalities on level 2 surveillance

- Immediate admission to special care nursery/NICU for further observation and laboratory assessments - See section 4.5.

4.2 When SGH is suspected

- Inform medical staff immediately for review or initiate a Clinical Emergency Response System (CERS) call Rapid Response call as per local CERS clinical business rules:
 - [NSW Health PD2025_014 Recognition and management of patients who are deteriorating](#)
 - [SGH BR 301 CBR Clinical Emergency Response Systems \(CERS\) Management: SGH](#)
 - [TSH BR 412 Clinical Emergency Response Management: The Sutherland Hospital](#)
- On-call consultant (for St George Hospital and Sutherland Hospital) or on-call fellow/consultant (at the Royal Hospital for Women) must be notified immediately of any suspected SGH.
- Transfer to Special Care Nursery (SCN) for monitoring and management when: local signs are confirmed or there are any signs suggestive of significant blood loss.

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4.3 Recognition of subgaleal haemorrhage: Local signs

- The initial localised signs of a SGH are of vague, generalised scalp swelling with laxity of the scalp at the site of cup application. The chignon (caput) in contrast, is firm in consistency and usually resolves within one hour
- If SGH progresses, the scalp feels fluctuant 'like a *leather pouch filled with fluid*' including free fluid between the scalp and skull. The newborn infant may also show signs of irritability due to pain when handled
- Large blood loss can occur despite a small increase in head circumference. Serial head measurements may be useful although it should be noted that large blood loss can occur despite a relatively small increase in head circumference (estimated 38 ml per cm increase in head circumference)
- The haemorrhage is not contained by suture lines (see diagram below). In severe cases, ear lobes may be displaced or shifted downwards by mass effect and eyelids may appear puffy.

4.4 Recognition of hypovolaemia: Systemic signs

- Tachycardia (>160/min), poor peripheral perfusion (capillary refill > 3secs) and/or pallor (vasoconstriction and anaemia) are late signs of significant blood loss.
- Hypotension (mean BP <40 mmHg in a term infant) is a late sign of hypovolaemia and should not be relied upon for early recognition
- Lethargy, tachypnoea, anaemia, acidosis and coagulopathy may ensue leading to circulatory collapse
- Biochemical indicators of progressing shock and impending collapse are a rising acidosis (base deficit), lactate, a falling haemoglobin (Hb) and a prolonged international normalised ratio (INR). Threshold trigger points for treatment are Hb less than 140 g/L and INR greater than 1.5.

4.5 Treatment in Neonatal Intensive Care Unit (NICU)/SCN - Observations in SCN for the first 12 hours

- Place the newborn infant on continuous pulse oximetry and cardiac monitoring. Record observations, initially half hourly for at least 1-4 hours
- Record admission blood pressure and initiate strict fluid balance documentation
- Palpate scalp and measure head circumference at 1, 2, 4, 6, 8, 10 and 12 hours
- Initiate blood pressure monitoring 1-4 hourly depending on the presence of other signs of hypovolaemia (see section 4.3).

4.6 Immediate Investigation and Management

- Stabilisation should not be delayed by investigation or imaging
- Keep parents informed with open and honest communication
- Obtain consent for administration of blood products
- Obtain Full Blood Count (FBC), Blood Glucose level (BGL), blood gas including lactate, electrolytes, coagulation profile and Group and Cross match on admission
- If any signs of shock (tachycardia, respiratory distress, oxygen requirement, pallor, poor capillary refill) - establish urgent IV access and commence aggressive fluid resuscitation using 10-20mL/kg of 0.9% sodium chloride or 15mL/kg of crossed matched or O negative blood and repeat 10 mL/kg bolus as clinically indicated
- Further blood products/neonatal Massive Transfusion Protocol (MTP) as per local guideline in discussion with Neonatologist which may include RBC, Platelets, FFP, Cryoprecipitate, Calcium and Tranexamic acid

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- Note: If >40mL/kg packed red blood cells (RBC) are required, consult with Haematology and consider neonatal Massive Transfusion Protocol as per local guidelines
- Prompt fluid resuscitation and correction of coagulopathy and acidosis are vital in the survival and outcome of SGH babies. Frequent re-evaluation of haemodynamic stability and response to blood and blood products is necessary
- Head ultrasound may be performed in admitted newborns with suspected or confirmed **mild** SGH. However, head ultrasound may not confirm the size and extent of SGH accurately. CT scan or MRI provides the objective measurement of haematoma volume. CT scan will also identify any underlying skull fractures. However, in most cases these investigations are not required and should not delay treatment of potential hypovolaemic shock. The decision to use CT or MRI is guided by whether there is suspicion of other intracranial haemorrhages or cerebral ischaemic events and should be made in consultation with a radiologist.

4.7 Continuing management in SCN

- In suspected but subsequently unconfirmed cases or in asymptomatic and small SGH, the newborn infant may be discharged from SCN after 12 to 24 hours of stable observations and only following review by a consultant paediatrician
- Newborn infants should be reviewed regularly for hyperbilirubinemia incorporating serum bilirubin (SBR) measurement above that which requires treatment to prevent encephalopathy and kernicterus as per [NSW Health Guideline GL2016_027 - Neonatal – Jaundice Identification and Management in Neonates ≥ 32 Weeks Gestation](#).

5. OTHER POSSIBLE FORMS OF HEAD TRAUMA

Subdural and cerebral haemorrhage may occur after spontaneous delivery (0.4 per 1000) or caesarean section. The prevalence is increased equally with vacuum or forceps births (1 per 1000) but the highest (2 per 1000) is following attempted but not successful assisted vaginal births, which have progressed to caesarean section or after a combined assisted vacuum and forceps birth.

There are no other special observations after assisted vaginal birth for subdural or other intracranial haemorrhages. These haemorrhages often present with neurological symptoms hours after delivery and not because of blood loss. For any clinical signs in deterioration of the newborn infant refer to [SESLHDPR/340 - Management of the deteriorating NEONATAL inpatient](#).

5.1 Management

- Apnoea and seizures are the common presentations
- Clinical signs include unequal pupils, eye deviation, irritability, tense fontanelle and coma
- Forceps associated local trauma may include skull fracture
- Diagnosis is established by cranial CT or MRI. Small subdural haemorrhage (SDH) may be missed by routine cranial ultrasound because of limited peripheral views
- Subdural hematomas have been associated with coagulation disorder
- Management is usually conservative
- Consider transfer to tertiary neonatal unit for evaluation and surgical consideration.

6. DOCUMENTATION

- eRIC clinical information system across NSW Health facilities
- Standard Neonatal Observation Chart (SNOC) Neonatal care plan, clinical notes
Refer deviations from the normal as per [NSW Health Policy Directive PD2025_014 - Recognition and management of patients who are deteriorating](#)
- eMR Medical record.

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- NSW Health Disclaimer for Declining of Neonatal Vitamin K (SES020200)

7. EDUCATIONAL NOTES

- Subgaleal haemorrhage is the collection of blood in the loose connective tissue between the apogee aponeurosis and periosteum of the skull
- An association between vacuum extraction and SGH is well described. Over the past three decades, increasing use of vacuum extraction to assist births has resulted in an increase in the prevalence of SGH in Australia and the developed world. The reported incidence is about 1 in 300 vacuum deliveries. Among babies admitted to NICU with SGH, newborn infant mortality ranges from 12% to 25%
- Tractional and rotational forces such as vacuum extraction can result in rupture of emissary veins resulting in haemorrhage into the subgaleal space. A 1-cm increase in the depth of subgaleal space may contain 40-260 mL of blood. Circulating blood volume of the neonate is about 90 mL/kg body weight. A serious 20% reduction in circulating blood volume occurs with a haemorrhage of only 54 mL in a 3 Kg newborn infant
- There are other *haemorrhages* that can occur and may raise diagnostic confusion with SGH.
- Refer to [Perinatal Practice Guidelines | SA Health](#) landing page, go to **Find SA Perinatal Practice Guidelines**. Go to **S** to access Subgaleal Haemorrhage guideline which includes Figure1 (page 6) displaying Location of injury in soft tissue places on the scalp and head.

8. AUDIT

- Monthly Mat IQ reported under Hospital acquired Neonatal birth trauma, presented at Maternity Neonatal Stream meetings and local Mortality and Morbidity meetings.

9. RESOURCES

- [SESLHDGL/050 - Assisted Vaginal Birth](#)
- [NSW Health Guideline GL2016_027 - Neonatal – Jaundice Identification and Management in Neonates ≥ 32 Weeks Gestation](#)
- [NSW Health Policy Directive PD2025_014 - Recognition and management of patients who are deteriorating](#)
- [RHWCLIN 075 - Blood product Transfusion and Management \(Neonate\)](#)
- [SESLHDPR/340 - Management of the deteriorating NEONATAL inpatient](#)
- [SGH BR 301 CBR Clinical Emergency Response Systems \(CERS\) Management: SGH](#)
- [TSH BR 412 Clinical Emergency Response Management: The Sutherland Hospital](#)

10. REFERENCES

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2. [Australian Commission of Safety and Quality in health Care. National Safety and Quality Health Service Standards 2nd ed.- version 2. Sydney ACSQHC;2021](#)
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[updated 07 May 2024, version 2] Available from: <http://www.sahealth.sa.gov.au/perinatal>

11. VERSION AND APPROVAL HISTORY

Date	Version	Author and approval notes
September 2011	Draft	SESLHD Clinical and Quality Council – August 2011 advised that the SESLHNP/134 Policy needed to be separated into a procedure. Dee Sinclair drafted the procedure
September 2011	1	Approved by A/Prof Kei Lui
April 2015	2	Updated by A/ Prof Kei Lui and Dr B Fonseca in conjunction with The Women’s and Babies Governance Committee
May 2015	2	Updates endorsed by Executive Sponsor
October 2015	3	Minor review endorsed by Executive Sponsor
April 2019	4	Updated by Dr Srinivas Bolisetty, Prof Kei Lui, Dr Bob Fonseca, Dr John Smyth, Dr Trent Miller, Dr Jeanette Taylor, Dr Meredith Ward, Dr Andrew Zuschmann Ms Lillian Sreckovic.
May 2019	4	Minor review approved by Executive Sponsor. Title of document changed. Updated evidence summary with contemporary articles and added educational summary. Creation of flow chart. Processed by Executive Services prior to publishing.
February 2020	5	Minor review approved by Executive Sponsor. Reference to ‘PACE’ in Section 4.2 updated to ‘Code Blue’ to align with Between the Flags terminology. Review date to remain. Processed by Executive Services prior to publishing.
May 2022	6	Minor review: Title change from Neonatal Observations for subgaleal haemorrhage following vaginal application of vacuum or forceps; links have been refreshed, references updated, and minor word changes have been made. Reviewed by Erica Wales, Quality Use of Medicines Pharmacist. Approved by Executive Sponsor. Processed by SESLHD Policy prior to publishing.
30 July 2025	6.1	Updated by Dr Srinivas Bolisetty, Dr Andrew Zuschmann, Dr John Smyth, Dr Kylie Yates, Dr Ellie Berger, Dr Alys Swindlehurst, Dr Andrew Bisits, CNC/A/CMC Jessi Mossman, CMC Rebecca Smith CMC, CE Georgia Brill, CMC Sherri Shannon CMC Alison Brown, CME Cheryl Byron, CM Karen Munro. Title change and updated Section 2, & 4.1 to align with The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Section 4.3 links added and minor wording changes. Section 4.6 Fluid resuscitation updated Section 4.7 & 5 minor wording changes and links added Section 7 Education updated Section 8 Audit References and links updated

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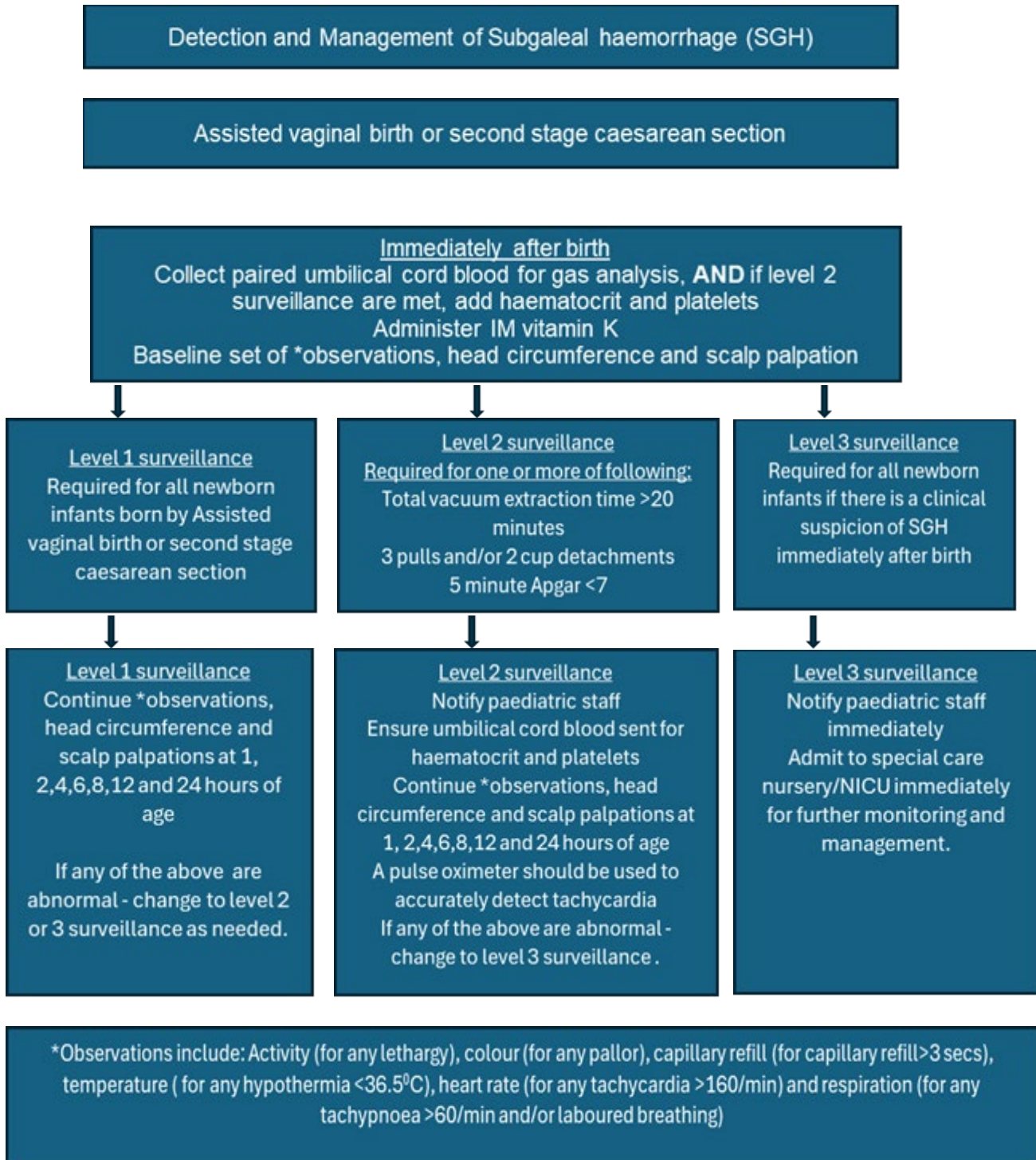
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		Appendix A: Vitamin K Disclaimer added Appendix B: New Flowchart on SBG detection and management by Dr Srin Bolisetty. Approved at SESLHD Patient Safety and Quality Committee.
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Appendix B: Detection and Management of Subgaleal Haemorrhage Chart



Source: Dr Srimi Bolisetty, Royal Hospital for Women, June 2025