New Zealand Newborn Clinical Network

Neonatal Subgaleal Haemorrhage Practice Recommendation

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On behalf of New Zealand Newborn Clinical Network Clinical Reference Group
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Background
A subgaleal haemorrhage (SGH) or subaponeurotic haemorrhage is a rare but life-threatening condition in a newborn baby. It is caused by rupture of the emissary veins, which are connections between the dural sinuses and the scalp veins. Rupture of these veins results in bleeding into the space between the galea aponeurotica and the periosteum, the subgaleal space. The subgaleal space is a layer consisting of loose connective tissue covering the entire cranial vault. This subgaleal space is not limited by sutures (Figure 1).

As a SGH is not limited to sutures, in contrast to a cephalohaematoma (see Figure 2), and a large amount of blood, up to a baby's whole blood volume, can accumulate into the subgaleal space. Therefore, a SGH in the newborn can lead to serious hypovolemia and is recognised as a rare but life-threatening condition.

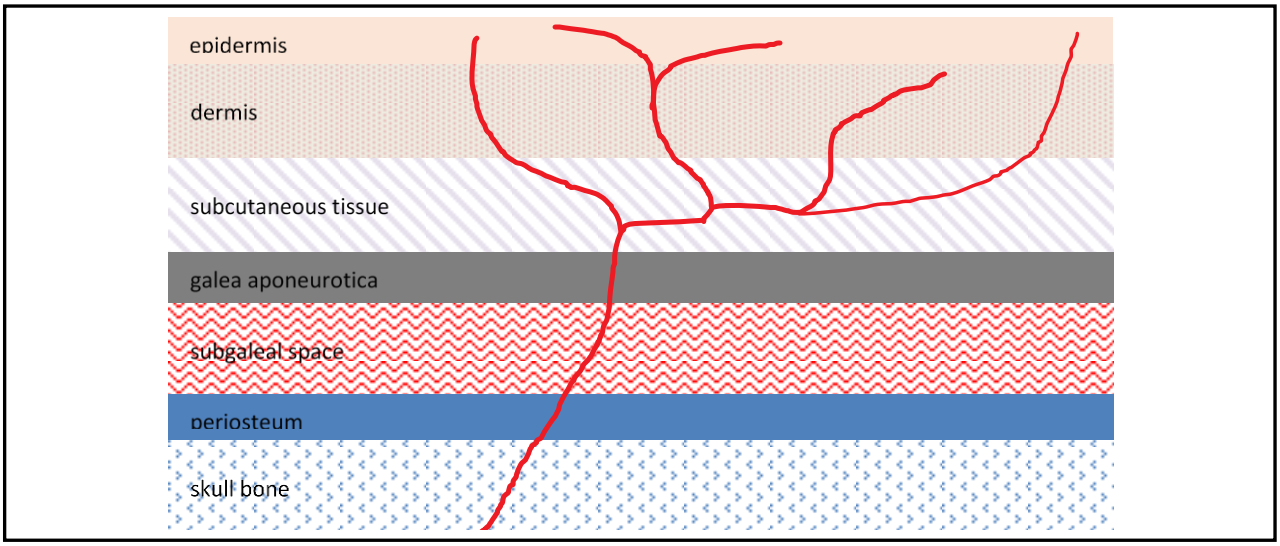

Figure 1: Schematic drawing of the layers of the scalp from the top down: epidermis, dermis, subcutaneous tissue, galea aponeurotica, subgaleal space, periosteum and skull bone. The emissary vein (in red) connects the dural sinuses with the scalp veins. Picture adapted from Seery, Dermatologic Surgery, 2002.

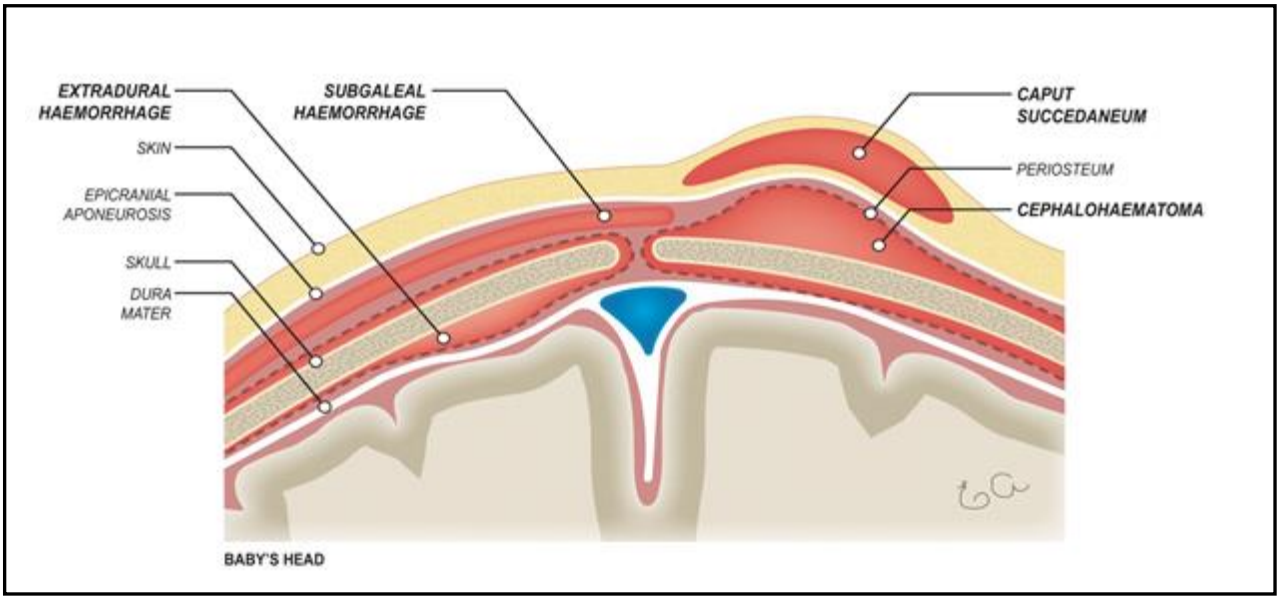

Figure 2

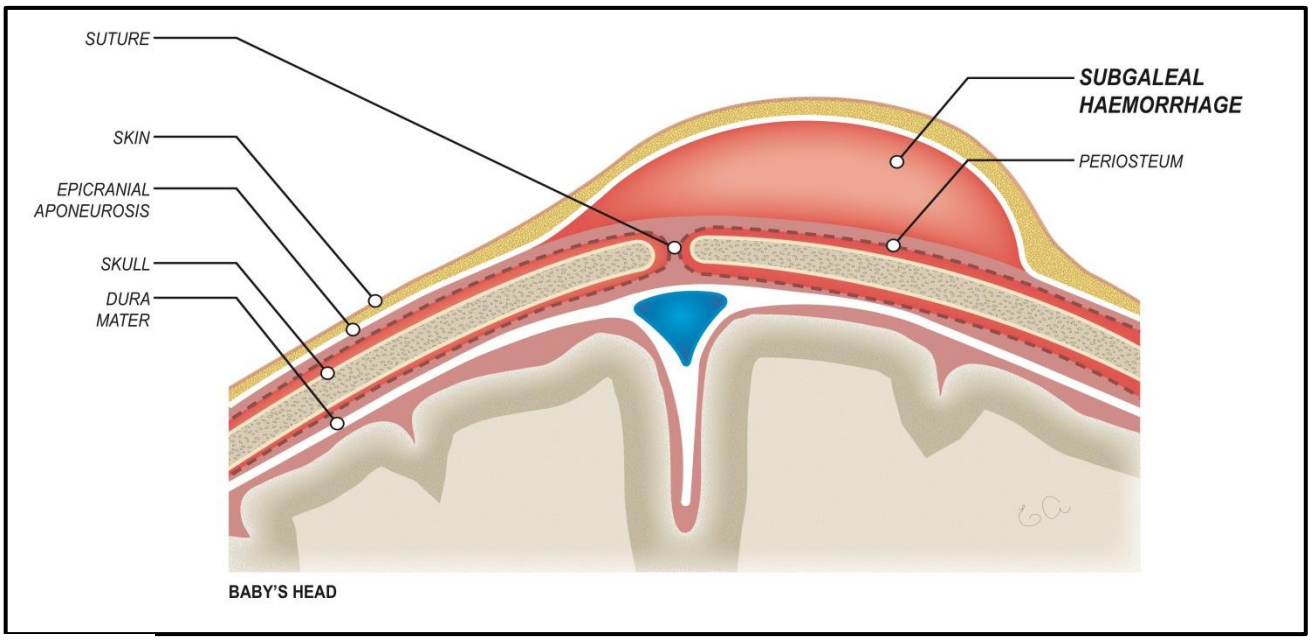

Figure 3

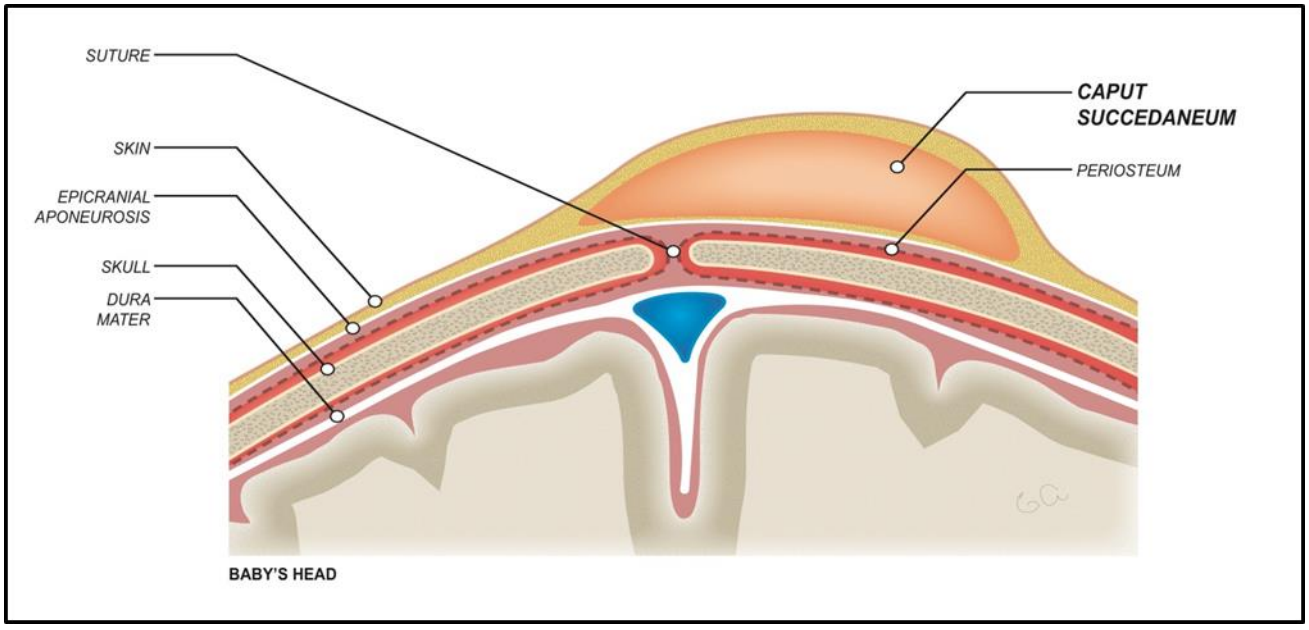

Figure 4

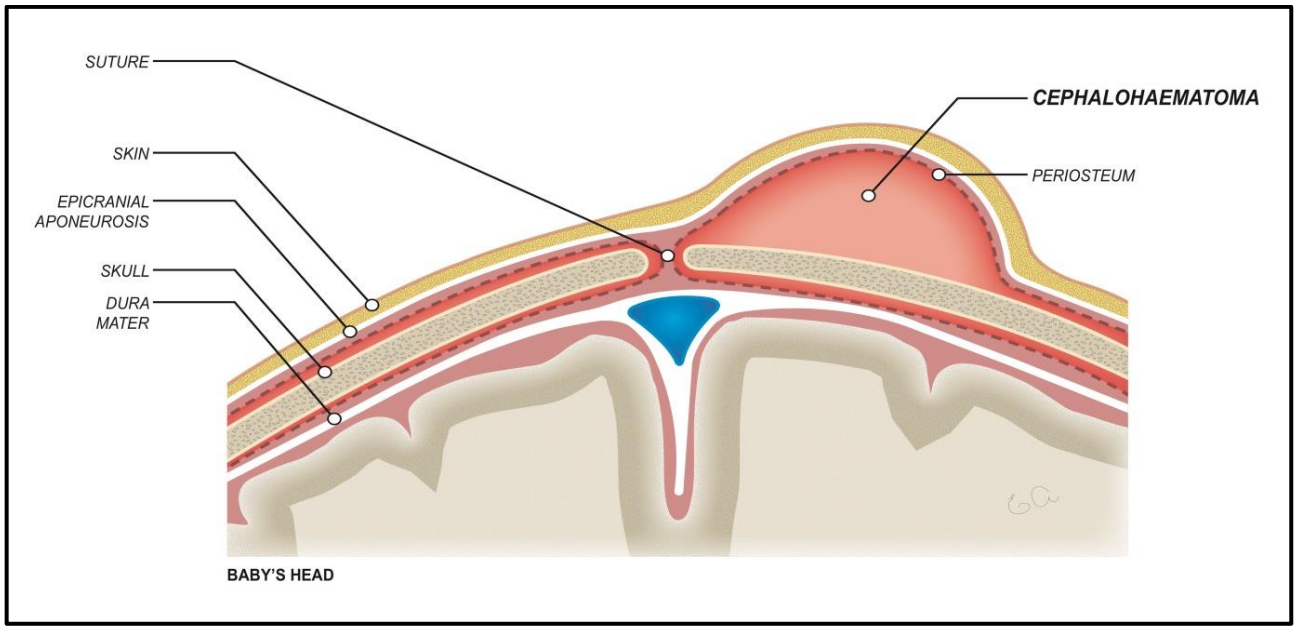

Figure 5

Figures 2, 3, 4 and 5: Schematic drawings of the anatomical position of different swellings that can occur on a newborn head. Please note that a cephalohaematoma is not crossing suture lines.

Incidence
The incidence of SGH has been estimated to be 1 in 2,000 for normal vaginal deliveries with an increase to 1 in 200 for vacuum assisted deliveries.[3] In New Zealand about 18% of standard primiparae undergo instrumental delivery with vacuum delivery making up about 10% of instrumental deliveries in ADHB.[4]

Mortality as a result of SGH has been described to be as high as 25% but earlier or better recognition has decreased mortality to 5-14% over recent years.[1] The mean time to diagnosis of a SGH is 1-6 hours after birth.[1]

Prompt diagnosis and early aggressive management of SGH can decrease mortality and morbidity. A Malaysian study demonstrated that a mean time to diagnosis of only 1 hour was achievable in a centre with a formal surveillance program for all babies born following exposure to vacuum assisted delivery.[2] Importantly, with this earlier recognition and active management they reported mortality to be as low as 2.8%.[2]

Vacuum exposure or delivery with vacuum is recognised as the most important risk factor for development of a SGH, but a SGH can also develop following spontaneous, forceps or birth via Caesarian section.

To enable early recognition and aggressive treatment of SGH, hopefully resulting in decreased mortality and morbidity for these babies in New Zealand, we developed the surveillance program as set out in these guidelines.

Risk factors for development of SGH
Compared to obstetric forceps, the vacuum extractor is easier to apply and has less maternal injuries. However, the vacuum extractor is associated with significantly more fetal injuries, including SGH. [5]

Well recognised risk factors for development of SGH in a newborn are:
- Vacuum delivery or attempted vacuum delivery, especially if:
  - ❖ inappropriate placement of vacuum cup,
  - ❖ prolonged vacuum >20 min [6],
  - ❖ 3 or more pulls (i.e traction during 3 or more contractions),
  - ❖ detachment of vacuum cup,
  - ❖ performed at < 36 weeks (relatively contra-indicated at < 36 weeks and contra-indicated at < 34 weeks),
- Maternal: Nulliparity
- Fetal: Haemophilia

Clinical manifestations
SGH is a clinical diagnosis with a large, diffuse, fluctuating mass that crosses suture lines and develops in the first hour to hours after birth. Diagnosis should NOT be delayed by imaging as prompt action is necessary, and delay awaiting confirmatory tests could be fatal.

- Features
  - ❖ Apgar <7 at 5min without asphyxia
  - ❖ Haemodynamic instability (increased HR, increased RR or WOB, pallor, prolonged capillary refill > 3 sec, metabolic acidosis, low BP)
  - ❖ Anaemia, coagulopathy

- Localised signs
  - ❖ Generalised scalp swelling, which is movable, fluctuant or ballotable, crossing suture lines, gravity dependent
  - ❖ Examine the supine infant by lifting head forward and using both hands behind the occiput; feel for fluctuance, try to push any swelling forward and if it moves forward freely, this indicates SGH.
  - ❖ Displacement of ears, peri-orbital oedema
  - ❖ Increased head circumference (late sign as approximately 35 ml of blood is needed to increase head circumference by ~ 1 cm)
  - ❖ A 1-cm increase in the depth of the subgaleal space may contain from 40mL to 260mL of blood.[7,8]
  - ❖ A fluctuant swelling localized to one skull bone (usually the parietal bone) is a cephalohaematoma, and is benign. Pitting oedema suggests a caput succedaneum, also benign.

Bleeding into the subgaleal space can lead to significant hypovolemia, anaemia and coagulopathy as a newborn's estimated blood volume is 80mL/kg; therefore, blood loss of 48 ml in 3 Kg baby equals loss of 20% of circulating volume.

Early diagnosis through neonatal surveillance
The intensity of neonatal surveillance (low, intermediate or high) should be based on the perceived risk of development of a SGH and is dependent on both clinical circumstances and neonatal condition.
The algorithm below is adapted from the RANZCOG College Statement C-Obs 28 with source Mercy Hospital for Women: Clinical Practice Guideline; Prevention, detection and management of subgaleal haemorrhage in the newborn.[9]

Algorithm for Detection and Management of Subgaleal Haemorrhage (SGH) in the Newborn

Low risk Surveillance
Is required for all newborn infants following attempted or successful instrumental delivery

Instrumental Birth (Attempted or successful)

- Attended by Paediatric/ Neonatal team according to local guideline, indicated if fetal distress, need for resuscitation.
- All babies should receive Intramuscular vitamin K, unless contra-indicated
- No hats to be worn during observation period
- Observation to occur in good light

Intermediate risk Surveillance
Is required for one or more of the following:

- Total vacuum extraction time>20 minutes
- 3 or more pulls
- 2 cup detachments
- 5 minutes Apgar <7
- At clinician's request

Low risk surveillance Observations at

- Birth
- 1-hour
- 4-hour

Intermediate Surveillance

- Notify paediatric staff
- Cord or venous / capillary FBC.
- Cord Lactate
- Consider group and hold.
- Observations at
  - Birth
  - 1 and 2 hours of age
  - 4, 6 and 8 hours of age
  - 12 hours of age

Refer for **High risk surveillance** if:

- Baseline HR >160bpm or rises > 20/min
- Tachypnoea RR >60 or increased work of breathing
- Pallor
- Poor perfusion (central capillary refill >3sec)
- Concern about scalp or increase in head circumference

High Risk Surveillance
Is required for all newborn infants if clinical suspicion of SGH immediately following birth or signs of SGH develop at any stage

High risk Surveillance

- Immediate review of newborn by (senior) paediatric staff
- Immediate admission to SCBU or NICU
- On admission, **must have urgent** capillary / venous FBC, crossmatch, coagulation profile and capillary gas
- Continuous monitoring of heart rate, RR and pulse oximetry
- BP Q15min for 4 hours, then hourly for at least 4 hours
- Insertion of IV access (2 peripheral drips or UVC)
- Confirm vitamin K had been administered I.M.

Observations include heart rate, colour, perfusion, activity and examination of scalp, all in a good light. Pulse oximetry is recommended (intermittently) unless **High risk surveillance** when it will be continuous.

Surveillance for SGH in the newborn infant

Management of all babies following attempted or successful instrumental delivery:

- Instrumental deliveries are often attended by Paediatrics / Neonatal team according to local guidelines, and especially where fetal distress is present and resuscitation required.
- All babies should receive Intramuscular vitamin K, unless contra-indicated
- No hats to be worn on baby during observation period
- Observations include heart rate, colour, perfusion, activity and examination of scalp, all in a good light as per NOC/NEWS chart
- Pulse oximetry is recommended (intermittently) unless **High risk surveillance** when it will be continuous.

Low risk surveillance

- Observations performed at birth, 1 and 4 hours of age
- Pulse oximetry is recommended (at assessment times) as this can enable early recognition of the onset of progressive tachycardia.
- A sheet for surveillance documentation is available in appendix 3

Intermediate risk surveillance

- Notify paediatric staff of Intermediate risk level for SGH if not in attendance
- Observations performed at birth, 1, 2, 4, 6, 8 and 12 hours. Document on surveillance sheet or similar e.g. NOC/NEWS chart if available
- Pulse oximetry (continuous or intermittent at assessment times) is strongly recommended as this can enable early recognition of the onset of progressive tachycardia.
- Cord FBC or venous/capillary FBC. Consider need for group and hold.
- Cord lactate and pH – (usual indications include for 5 min Apgar < 7, active resuscitation, fetal distress on CTG, meconium stained liquor)
- Repeat Lactate at 4 hours.

Escalation to High Risk surveillance (high clinical suspicion of SGH)

Signs of clinical deterioration and need for escalation from Low or intermediate surveillance to high risk surveillance is (without this being a complete list):

- Heart rate >160 bpm or a rise of >20 bpm in baseline
- Tachypnoea RR > 60 bpm or increased work of breathing
- Pallor
- Poor perfusion (central capillary refill >3 sec), lactate > 3mmol/L
- Concerns about the scalp (boggy swelling / large, diffuse, fluctuating mass that crosses sutures / peri-orbital oedema / displacement of ears / other concerns)
- Increase in head circumference, if measured
- Other concerns needing urgent paediatric review by (senior) paediatric staff.

High risk surveillance (high clinical suspicion of SGH)

- Review of baby by (senior) paediatric staff ASAP.
  - **Confirmed suspicion of SGH**: immediate admission to SCBU or NICU
  - **Confirmed SGH** (diagnosis clinically confirmed): immediate admission to SCBU or NICU and escalate care to Management of confirmed SGH (see page 8)
- Continuous monitoring of heart rate, RR and pulse oximetry
- Blood pressure to be done Q15 min for 4 hours, then hourly for at least 4 hours
- Insertion of IV access (2 peripheral drips or UVC)

- Urgent capillary/venous FBC, crossmatch, coagulation profile (PR, APTT, Fibrinogen) and capillary gas with lactate.
- Confirm vitamin K has been administered I.M.

Management of confirmed SGH

Send for help

- Admit to SCBU/NICU
- Discuss with level 3 unit within hour of diagnosis
- Plan for early transfer
- Activate Massive Haemorrhage Pathway (MHP) (appendix 2).
- Consider discussion with hematologist

Airway and breathing

- Continuously monitor RR and pulse oximetry
- Consider respiratory support or intubation and ventilation early

Circulation

- Insertion of IV access (2 peripheral IV drips or UVC/UAC)
- Urgent capillary/venous FBC, crossmatch, coagulation profile (PR, APTT, Fibrinogen) and capillary gas
- Monitor HR continuously
- Monitor BP Q 15 min for 4 hours, then hourly for at least 4 hours once stabilised
- Monitor urine output (aim for > 1 ml/Kg/hour)
- Volume expansion with 10-20 ml/Kg of normal saline 0.9%, if:
  - Tachycardia > 160 bpm or > 20 bpm above baseline
  - Poor peripheral perfusion or capillary refill > 3 sec
  - Mean blood pressure < 40 mmHg in term infant
  - pH < 7.3 or lactate > 3 mmol/L
- Inotropic support may be necessary but mainstay for treatment is volume expansion.

Blood products and haemostasis

- Confirm I.M. vitamin K has been given or administer vitamin K 1mg = 0.1ml iv at a rate of 1mg/minute. A dose of 1mg vitamin K IM is also recommended at some stage.
- Coagulation profiles should be done but urgency of treatment often precludes waiting for results.
- RBC transfusion if Hb < 140 g/L or at any Hb if severe hypovolaemia.
  Use O neg or type specific and give 15 mL/Kg
  Can be given in 10 min for severe hypovolaemia or faster for extreme hypovolaemia.
- If ongoing hypovolaemia, bleeding or instability due to SGH activate **Massive Haemorrhage Pathway** (see appendix 2). Inform local laboratory or blood bank.
  a) Transfuse 10 mL/Kg of each in following order: RBC, FFP, RBC, Cryo
  b) Administer 0.15 mL/Kg of CaCl 10% or 0.45 mL/Kg of CaGluc 10%. Do NOT administer calcium in same IV line at same time as blood products.

c) Give 10ml/Kg of RBC, FFP, RBC, platelets, and give calcium as in b) above
Repeat a) to c) if necessary
d) Stop transfusing and inform laboratory/blood bank once clinically stable.

- Repeat FBC and coagulation studies every 4 hours until stable.
- Aim for INR <1.5, APTT < 40 s, fibrinogen > 1 g/L and platelets > 75 x 10^9/L; however, transfusion of blood products should be driven by clinical picture. Therefore, once clinical stability has been achieved further transfusion can be stopped even if coagulation profile hasn't normalised yet.

Acidosis treatment

Aim for pH > 7.3. Lactate < 3 mmol/L

- Consider correction with sodium bicarbonate 8.4% if pH < 7.3 as coagulation disorders may deteriorate further at a low pH.
  - Half correction (ml) = BE x weight (Kg) x 0.3
    (i.e. BE -10 x 3 kg x 0.3 = 9 mls of sodium bicarbonate 8.4% diluted with 9 mls of H_2O given over 30 min iv)
- Check blood gas and re-assess if further dose is indicated.

Electrolytes and glucose

- Aim for normal ionized Calcium levels (1.1 - 1.35 mmol/L) as ionized Calcium < 0.6 mmol/L leads to serious coagulation disorders.
- Check potassium levels as both hypo- and hyperkalemia can occur.
- Check glucose and treat appropriately.

Temperature

- Aim for normothermia as each 1˚ C drop in temperature leads to 10% decrease in coagulation factor activity.

Other

- Head bandaging is NOT recommended as it may increase intracranial pressure.
- Imaging should await stabilisation of the infant and NOT be used to diagnose SGH.
- Imaging by USS, skull X-ray, CT or MRI can be helpful to diagnose complications and co-morbidities, such as HIE, dural tears, sagittal sinus rupture or skull fracture).
- Check SBR and treat early with phototherapy as sick babies are at increased risk of kernicterus.
- Keep parents informed and obtain consent for blood products transfusion.

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Appendix 1: Approximate Coagulation Reference for Newborn

Table 1

Approximate coagulation reference range values in newborns compared with older children and adults[a] [1-4]

Test or level	Preterm infant, 30-36 GA, at day 1	Preterm infant, 30-36 GA, at day 30	Term infant, at day 1	Children 1-12 mo	Children 1-5 y	Children 6-10 y	Children 11-16 y	Adults
PT[a] (s)	10.6-16.2	10.0-13.6	14.4-16.4	11.5-15.3	12.1-14.5	11.7-15.1	12.7-15.1	11.5-14.5
aPTT[a] (s)	27.5-79.4	26.9-62.5	34.3-44.8	35.1-46.3	33.6-43.8	31.8-43.7	33.9-46.1	28.6-38.2
Fibrinogen (g/L)	1.5-3.25	1.50-4.14	1.92-3.74	0.82-3.83	1.62-4.01	1.99-4.09	2.12-4.33	1.9-4.3
PFA-100 collagen/ADP closure time (s)			40-92			89 ± 20		
Bleeding time (min)						2.5-13		1-7 [25]
vWF (U/mL)	0.78-2.10	0.66-2.16	0.50-2.87			0.44-1.44		0.50-1.58
Factor II (U/mL)	0.20-0.77	0.36-0.95	0.41-0.69	0.62-1.03	0.7-1.09	0.67-1.10	0.61-1.07	0.78-1.38
Factor V (U/mL)	0.41-1.44	0.48-1.56	0.64-1.03	0.94-1.41	0.67-1.27	0.56-1.41	0.67-1.41	0.78-1.52
Factor VII (U/mL)	0.21-1.13	0.21-1.45	0.52-0.88	0.83-1.6	0.72-1.5	0.7-1.56	0.69-2	0.61-1.99
FVIII (U/mL)	0.50-2.13	0.50-1.99	1.05-3.29	0.54-1.45	0.36-1.85	0.52-1.82	0.59-2	0.52-290
FIX (U/mL)	0.19-0.65	0.13-0.80	0.35-0.56	0.43-1.21	0.44-1.27	0.48-1.45	0.64-2.16	0.59-2.54
Factor X (U/mL)	0.11-0.71	0.20-0.92	0.46-0.67	0.77-1.22	0.72-1.25	0.68-1.25	0.53-1.22	0.96-1.71
Factor XI (U/mL)			0.07-0.41	0.62-1.25	0.65-1.62	0.65-1.62	0.65-1.39	0.67-1.96
Factor XII (U/mL)			0.43-0.8	0.2-1.35	0.36-1.35	0.26-1.37	0.14-1.77	0.35-2.07
AT (U/mL)	0.39-0.87	0.48-1.08	0.58-0.9	0.72-1.34	1.01-1.31	0.95-1.34	0.96-1.26	0.66-1.24
α_2-Macro-globulin (U/mL)	0.95-1.83	1.06-1.94	0.95-1.83			1.28-2.09		0.52-1.20
Protein C clotting (U/mL)	0.17-0.53	0.21-0.65	0.24-0.4	0.28-1.24	0.5-1.34	0.64-1.25	0.59-1.12	0.54-1.66
Protein S (clotting; U/mL)	0.12-0.60	0.33-0.93	0.28-0.47	0.29-1.62	0.67-1.36	0.64-1.54	0.65-1.4	0.54-1.03

Abbreviations: GA, gestational age in weeks; PT, prothrombin time; aPTT, activated partial thromboplastin time; PFA, platelet function analyzer; ADP, adenosine diphosphate.

[a] Actual reference ranges vary between laboratories and for different reagents and assays.

Appendix 2: Paediatric massive haemorrhage pathway (PMHP)
Downloaded from Starship clinical guidelines - Massive Haemorrhage Pathway (29/02/2024)

Paediatric Massive Haemorrhage Pathway

Massive Bleeding PLUS signs of Shock or Coagulopathy

INITIATE Call Blood Bank 24015. State **"I am requesting Paediatric Stat Pack"**
Provide patient gender and weight (estimated or actual)

SEND Group + Screen

CONSIDER Tranexamic Acid (15mg/kg to maximum 1g)

Paediatric Stat Pack: 2 RBC (1 RBC < 10kg)
Transfuse 10mL/kg OR 1 unit RBC if > 30kg then reassess
Ongoing bleeding or shock then transfuse 10mL/kg OR 1 unit if > 30kg

REASSESS Ongoing Massive Bleeding or Shock?

ACTIVATE **Paediatric MHP**: Identify Transfusion Coordinator and call Blood Bank 24015
State **"I am activating Paediatric MHP Alpha/Bravo/Charlie OR Adult Standard MHP"**
Provide patient NHI + gender + weight (estimated or actual)

ALPHA 0-10kg	BRAVO 11-20kg	CHARLIE 21-45kg	ADULT STANDARD MHP > 45kg
ALPHA pack 1 RBC 1 FFP 1 Cryo 1 Neo Platelets	**BRAVO Pack 1** 1 WB only Or 1RBC & 1 FFP	**CHARLIE Pack 1** 2 WB only Or 2 RBC & 2 FFP	**STANDARD Pack 1** 2 RBC & 2 FFP Or 2 WB
Transfuse 10mL/kg in the following order:	With each pack, give 0.3mL/kg Ca. gluconate		With each pack, give - 10mL Ca. chloride or - 30mL Ca. gluconate
First Round RBC, FFP RBC, Cryo 0.45mL/kg Ca. gluconate	**BRAVO Pack 2** 1 RBC 1 FFP 1 Cryo	**CHARLIE Pack 2** 2 RBC 1 FFP 2 Cryo	**STANDARD Pack 2** 4 RBC 4 FFP 3 Cryo
Second Round RBC, FFP RBC, Platelets 0.45mL/kg Ca. gluconate	**BRAVO Pack 3** 1 RBC 1 FFP 150mL Platelets*	**CHARLIE Pack 3** 2 RBC 2 FFP 1 Platelets*	**STANDARD Pack 3** 4 RBC 4 FFP 1 Platelets*
Repeat	**Alternate pack 2 & 3**	**Alternate pack 2 & 3**	**Alternate pack 2 & 3**

Coagulation Targets	If Not, Give	Bloods (repeat every 30 min)
PR < 1.5 | APTT < 40	20mL/kg FFP	Blood gas (including K^+/Ca^{++})
Fibrinogen > 1g/L	5mL/kg Cryo	FBC
Platelets > $75x10^9$/L	10mL/kg Platelets*	Coags (including fibrinogen)
Ionised Ca > 1.1mmol/L	0.3mL/kg Ca. gluconate	Viscoelastic if available e.g. TEG®

*See notes on page 2

Te Whatu Ora Health New Zealand

NZBLOOD Te Ratonga Toto O Aotearoa

Team Leader of the Resuscitation

- The team leader is the decision maker including activation of the MHP once the stat packs have been transfused
- Send urgent group & screen sample to Blood Bank
- Ensure Tranexamic Acid is administered, as a bolus through a fast flowing IV line

Transfusion Coordinator (e.g. Guardian, Coordinator)

- Supports the team leader
- Once the MHP has been activated, communicate with the Blood Bank team

Tasks (Delegated as necessary)

- Once Stat Packs have been transfused - reassess the patient in conjunction with the team leader
- If required after stat pack - activate MHP, state which MHP pathway (i.e. Alpha/Bravo/Charlie/Adult Standard MHP)
    - If senior clinician requests MHP activation immediately, stat pack is still issued while the blood bank prepared pack 1
- Ensure Blood Bank have your name and contact number
- Organise adequate orderly/ health care assistant support (fetching Stat Pack from Lamson and Packs from Blood Bank)
- Repeat MHP bloods every 30 minutes
- With every MHP pack, ensure Calcium is given through fast flowing line
- Hand-over coordination role if patient location changes; ensure Blood Bank notified of new coordinators name and number
- Cease MHP once the patient is clinically stable, inform Blood Bank, move to targeted therapy
- Ensure transfusion documentation/ checklists maintained; all swing labels retained

***Smaller Centres should** check Full Blood Counts BEFORE giving platelets, avoiding if PLT > 75 x 10^9 /L

Blood Bank roles

- Process urgent group and screen
- Liaise with transfusion coordinator
- Release Stat Pack and MHP packs as per SOP
- Notify NZBS TMS as per SOP & manage inventory
- Ensure Blood Bank MHP Tracking form/ checklist documentation and eTraceline records maintained

Smaller Centres BEFORE releasing Pack 3, liaise with MHP coordination role to confirm PLT count is < 75 x 10^9 /L

MHP Runner

- This can be HCA/Orderly/RN or anyone else available to collect blood products from Blood Bank
- Liaise with the transfusion coordinator regarding product Collection
- Stay with the MHP until you are released by the transfusion coordinator
- Return blood products to Blood Bank as directed by the transfusion coordinator

Infusion Standards

- RBC, FFP, Cryoprecipitate:
    - warmed
    - standard blood infusion set
- Platelets:
    - warmed or room temp
    - new infusion set preferred, not essential

Clinical Targets

- Surgical/ radiological **control of bleeding** ASAP
- Normal **pH/base deficit**
- Normal body **temperature**
- **A lower MAP** may be tolerated until bleeding slowed
    - unless brain injury

Glossary

RBC: red blood cells	**WB**: whole blood	**FFP**: fresh frozen plasma
Cryo: cryoprecipitate	**Neo**: neonatal	**PLT**: platelets
Ca: calcium	**PR**: prothrombin ratio	**Coags**: basic haemostasis screen

Te Whatu Ora Health New Zealand

NZBLOOD Te Ratonga Toto O Aotearoa

Appendix 3: Documentation of surveillance of babies at risk of Subgaleal haemorrhage (SGH)

Table can be printed for use in the medical notes for babies at risk of SGH

- For babies on low risk surveillance, please record data at (birth, 1 and 4h of age
- For babies on intermediate risk (Int-R) surveillance, please record data at birth, 1, 2, 4, 6, 8 and 12h of age

Complete data or circle as appropriate per given time point. Organise Paediatric review as indicated.

Surveillance for babies at low and intermediate risk of SGH. Patient label								
	ALL	ALL	Int-R	ALL	Int-R	Int-R	Int-R	
Age	Birth (hh:mm)	1 h	2 h	4 h	6 h	8 h	12 h	Paediatric review if:
Heart rate (bpm)								Heart rate > 160bpm or rise of >20 bpm
Resp rate (bpm)								Resp rate > 60 bpm
Work of breathing increased (yes/no)	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Work of breathing increased
Saturation (%)								Saturation < 92%
Colour	Normal Pale Pale ++	Normal Pale Pale ++	Normal Pale Pale ++	Normal Pale Pale ++	Normal Pale Pale ++	Normal Pale Pale ++	Normal Pale Pale ++	Pale or Extremely pale ++
Perfusion: Capillary refill time *	<3 sec or > 3 sec	< 3 >3	< 3 >3	< 3 >3	< 3 >3	< 3 >3	< 3 >3	Perfusion > 3 sec
Lactate if Int-R @ Birth & 4h Or requested	mmol/L			mmol/L				Lactate > 3mmol/L
Scalp	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Normal Caput CepH.# SGH	Abnormal exam Urgently if SGH
Completed by: Name: Sig: Role:								
Referred to, at: (hh.mm)								
Outcome								

Int-R=Intermediate risk CepH.# = cephalohaematoma SGH Subgaleal Haemorrhage

Capillary refill: press on the sternum for 5 seconds – assess time for colour to return