Note:
This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient’s medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Explanation of the aboriginal artwork:
The Aboriginal artwork used symbolises the connection to country and the circle shape shows the strong relationships amongst families and the Aboriginal culture. The horse shoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horse shoe shape depicts a pregnant woman. The smaller horse shoe shape in this instance represents the unborn child. The artwork shown before the specific statements within the document symbolises a footprint and demonstrates the need to move forward together in unison.

Purpose and Scope of Perinatal Practice Guideline (PPG)

The purpose of this guideline is to give clinicians information on the signs of severe local anaesthetic toxicity with subsequent management and follow up care.
Flowchart: Regimen for intravenous lipid emulsion

Immediately
Give an initial intravenous bolus injection of
20% lipid emulsion
1.5 mL/kg over 1 minute

And
Start an intravenous infusion of 20% lipid emulsion at
15 mL/kg/hour

After 5 minutes
Give a maximum of 2 repeat boluses (same dose)
if:
- Cardiovascular stability has not been restored
- An adequate circulation deteriorates
Leave 5 minutes between boluses
A maximum of 3 boluses can be given (including
the initial bolus)

And
Continue infusion at same rate, but:
Double the rate to 30 mL/kg/hour at any time after
5 minutes if
- Cardiovascular stability has not been restored
- An adequate circulation deteriorates
Continue infusion until stable and adequate
circulation restored or maximum dose of lipid
emulsion given

Do not exceed a maximum cumulative dose of 12 mL/kg

An approximate dose regimen for a 70 kg patient would be as follows

Immediately
Give an initial intravenous bolus injection of
20% lipid emulsion 100 mL over 1 minute

And
Start an intravenous infusion of 20% lipid emulsion
at 1000 mL/hour

After 5 minutes
Give a maximum of 2 repeat boluses of 100 mL

And
Continue infusion at same rate, but double rate to
2000 mL/hour if indicated at any time

Do not exceed a maximum cumulative dose of 840 mL

Summary of Practice Recommendations

- Follow Basic Life Support (BLS) and Advanced Life Support (ALS) algorithms
- As recovery from local anaesthetic-induced cardiac arrest may take >1 hour, continue resuscitation efforts for this time
- Give intravenous 20% lipid emulsion

Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<td>%</td>
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<td>&gt;</td>
<td>greater than</td>
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<td>mg</td>
<td>milligram</td>
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<td>IV</td>
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<td>kg</td>
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<td>%</td>
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Definitions

<table>
<thead>
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<tr>
<td>Local anaesthetic toxicity</td>
<td>A potentially fatal complication of regional anaesthesia. It can also occur in other situations with local anaesthetic injections</td>
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Signs of severe toxicity

Local anaesthetic toxicity may occur some time after the initial injection

- **Central nervous system:** sudden alteration in mental status, severe agitation or sudden loss of consciousness with or without tonic-clonic convulsions
- **Cardiovascular system:** cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur

Immediate management

- Stop injecting the local anaesthetic
- Follow Basic Life Support algorithm as per Maternal Collapse PPG (see A-Z listing at www.sahealth.sa.gov.au/perinatal)
- Seek immediate help following local hospital / health facility procedures for Emergency Response Team
- If not already present, page / contact senior anaesthetist and request additional anaesthetic assistance
- Maintain the airway and, if necessary, secure it with a tracheal tube
- Give 100 % oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing pH in the presence of metabolic acidosis)
- Confirm or establish intravenous access
- Control seizures:
  - First line – Midazolam IV 0.1–0.2 mg / kg as a slow bolus;
  - If seizures do not terminate, give
    - Thiopentone IV 125-250 mg in incremental doses of 25 mg over 10 minutes OR
    - Propofol IV 1-1.5 mg / kg
- Please note: Care must be taken that someone with airway skills is available if thiopentone or propofol are given in the event of respiratory depression.
- Assess cardiovascular status throughout
- Consider drawing blood for analysis but do not delay definitive treatment to do this

Management in cardiac arrest

- Manage arrhythmias, recognising that the arrhythmias may be very refractory to treatment
- Consider the use of cardiopulmonary bypass if available
- **GIVE INTRAVENOUS 20% LIPID EMULSION** (follow the regimen above)
- Continue CPR throughout treatment with lipid emulsion
- Recovery from local anaesthetic-induced cardiac arrest may take >1 hour
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine (lignocaine) should not be used as an anti-arrhythmic therapy
- Consider immediate birth via perimortem caesarean section in pregnant women beyond 24 weeks gestation

Management without cardiac arrest

Use conventional therapies to treat

- Hypotension
- Bradycardia
- Tachyarrhythmia

**STRONGLY CONSIDER INTRAVENOUS LIPID EMULSION** (It is difficult to predict which patients will progress to cardiovascular collapse and lipid emulsion can prevent this deterioration. It is a low risk intervention with potentially significant benefit).
Follow-up

- Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved.
- Pancreatitis is a potential complication of intravenous lipid emulsion, although assays for amylase and lipase are unreliable. Clinical diagnosis and consideration of radiological diagnosis is required.
- Notify hospital management in accordance with local Clinical Governance guidelines and complete a Safety Learning System (SLS) notification.
References

Acknowledgements

This guideline has been adopted from the Association of Great Britain and Ireland Guidelines for the Management of Severe Local Anaesthetic Toxicity1 and is endorsed by the Australian and New Zealand College of Anaesthetists.

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Write Group Lead
Dr John Pieterse
Rebecca Smith

Original Write Group Members
Dr Kym Osborn
Dr Deb Simmons
Dr Richard Willis
Dr Peter Lillie
Dr Brian Peat
Dr Elinor Atkinson
A/Prof Gus Dekker
Prof Marc Kierse
Judy Coffey
Valerie Thrupp

SAPPG Management Group Members
Sonia Angus
Lyn Bastian
Dr Kris Bascomb
Dr Elizabeth Beare
Elizabeth Bennett
Dr Feisal Chenia
John Coomblas
Dr Vanessa Ellison
Jackie Kitschke
Dr Kritesh Kumar
Catherine Leggett
Dr Anupam Parange
Rebecca Smith
A/Prof Chris Wilkinson
Local Anaesthetic Toxicity (severe)

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- Does this policy replace another policy with a different title? N
  If so, which policy (title)?

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