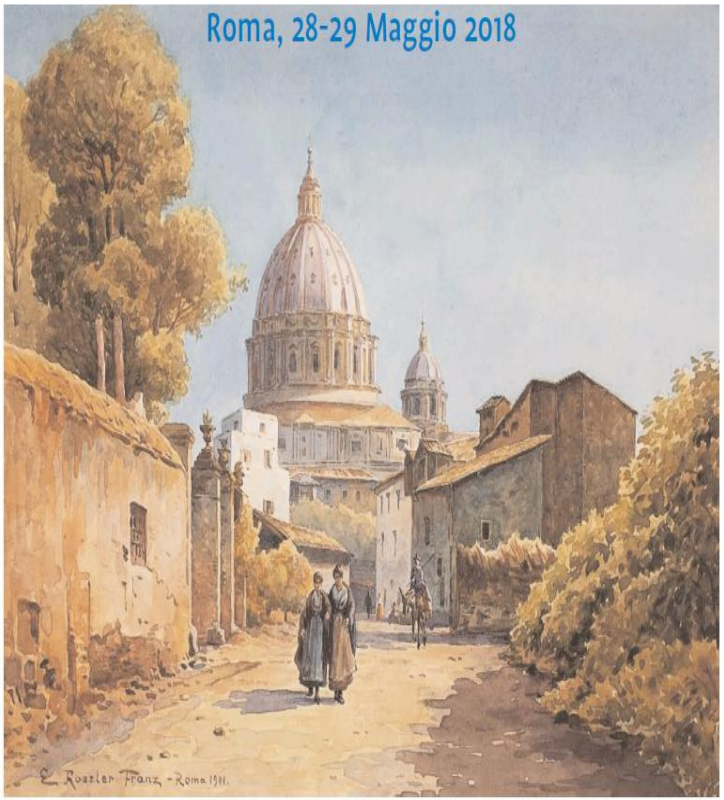
SAPIENZA UNIVERSITÀ DI ROMA

Nefrologia Interventistica

Corso Avanzato di Nefrologia Interventistica

La tecnologia al servizio della programmazione, creazione e gestione dell'accesso vascolare per emodialisi



SAPIENZA UNIVERSITÀ DI ROMA

Blocco del plesso brachiale

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Nefrologia Interventistica

ANESTESIA PER CHIRURGIA ACCESSI VASCOLARI

Locale

Nessun effetto emodinamico
Non possibile utilizzo emostasi preventiva

Generale

Invasiva
Effetto emodinamico solo intra-operatorio

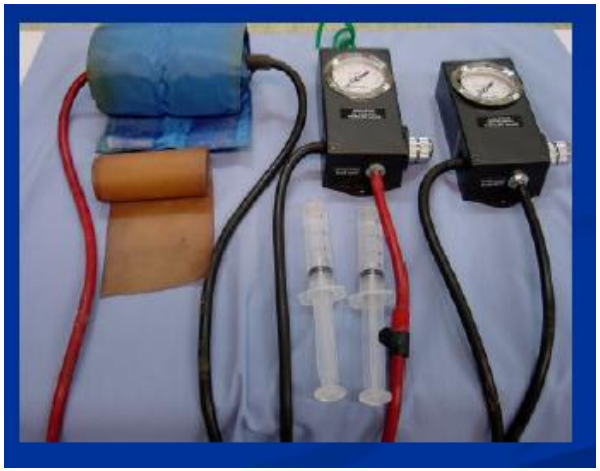
Loco-regionale

Poco invasiva (grazie alla tecnologia)
Effetto emodinamico intra e post operatorio
Possibile utilizzo emostasi preventiva

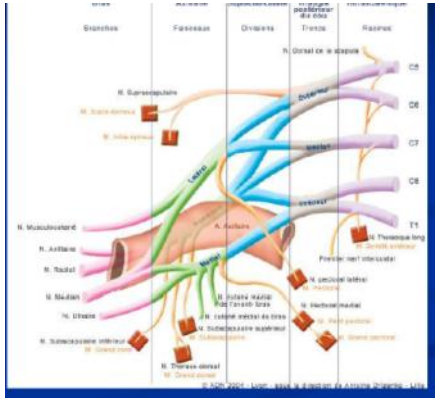
Tecniche del passato

Accesso trans-brachiale
Invasivo
Ematoma
S. da riassorbimento

Endovenoso
Invasivo
Tempo limitato
«laccio venoso».



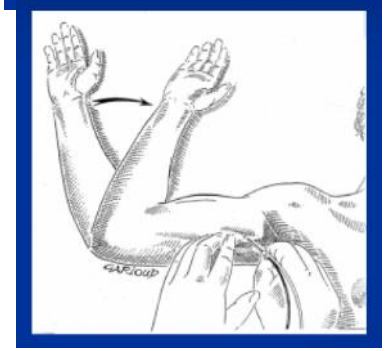
Elettro-neurostimolatore



Mediano

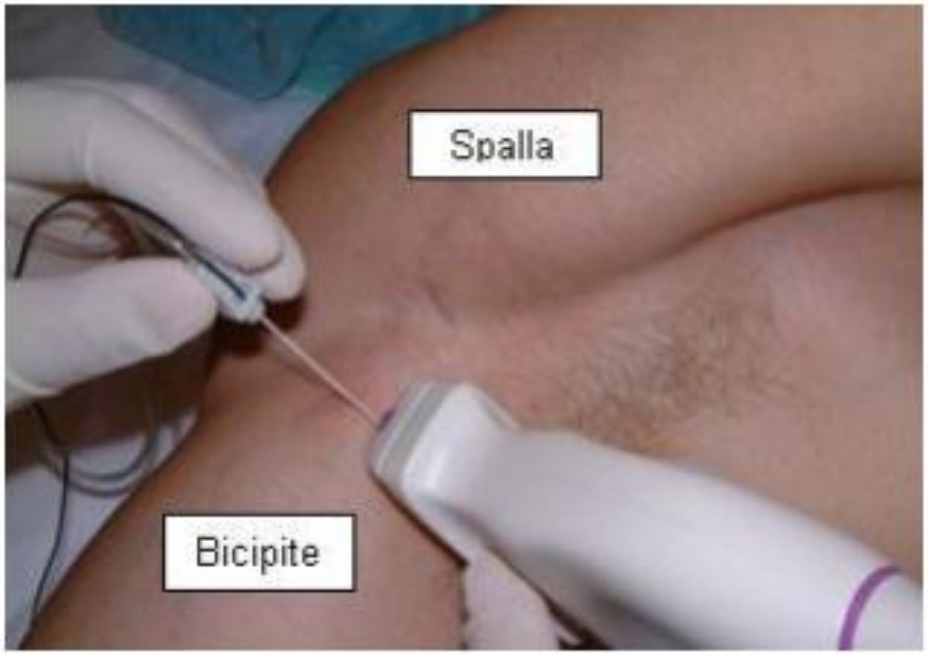
Radiale

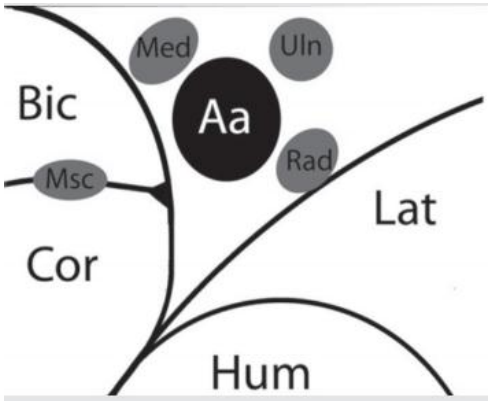
Ulnare



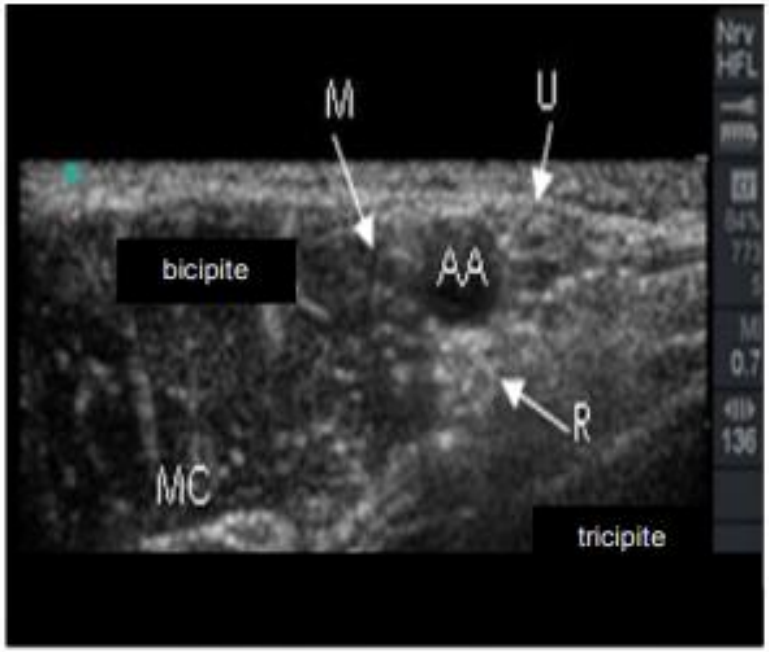
Muscolo cutaneo

Blocco ecoguidato





M: n. mediano, **U**: n. ulnare, **AA**: a. ascellare,
MC: n. muscolo cutaneo, **R**: n. radiale



Anestesia loco-regionale

Effetto emodinamico intra-operatorio: venodilatazione

Ann Vasc Surg. 2007 Nov;21(6):730-3. Epub 2007 Aug 20.

Regional nerve block allows for optimization of planning in the creation of arteriovenous access for hemodialysis by improving superficial venous dilatation.

Laskowski IA[1], Muhs B, Rockman CR, Adelman MA, Ranson M, Cayne NS, Leivent JA, Maldonado TS.

Author information

Abstract

Durable vascular access for hemodialysis remains a critical issue in end-stage renal disease patients. Creation of an autogenous arteriovenous (AV) fistula in the most distal location of the nondominant extremity is the preferred technique and provides superior patency over an AV graft. Others have shown that regional anesthesia in the form of axillary block results in the dilatation of the native veins and allows for their increased utilization in creating AV fistulae. We report on 26 patients undergoing creation of a vascular access for hemodialysis. Regional anesthesia consisting of axillary nerve block was used in all cases. All surgical plans with regard to the site and type of access were made based on the physical exam and ultrasound vein measurements taken prior to surgery. On the day of surgery patients were reevaluated with venous ultrasound using tourniquet before and after administration of the regional block. The previously determined operative plan either remained unchanged or was modified depending on the venous dilatation noted after administration of regional block. Among 26 patients, average vein diameter increased from 0.29 +/- 0.12 cm to 0.34 +/- 0.11 cm (P = 0.008). Twenty-one of 26 patients had no modification in operative plan (group 1). Five had some modification of the original operative plan (group 2): AV graft to a brachial vein transposition (n = 2), AV graft to a Cimino fistula (n = 2), and brachiocephalic to a Cimino (n = 1). The average follow-up for all patients was 82.6 +/- 75.6 days and did not differ between the groups. There was one failure in a patient from group 1, and there was no significant difference in the patency rate between study groups (P = 0.29). Following regional nerve block, operative plans in patients undergoing AV access surgery were modified in 29.4% of patients undergoing creation of an AV access for hemodialysis; either from graft to fistula creation or from the proximal to more distal fistula site. The routine use of regional anesthesia as well as intraoperative ultrasound during AV access surgery can lead to improved site selection and increased opportunity for AV fistula creation.

PMID: 17703918 DOI: 10.1016/j.avsg.2007.07.001

[Indexed for MEDLINE]

Anestesia loco-regionale

Effetto emodinamico intra-operatorio: venodilatazione

J Vasc Access. 2011 Oct-Dec;12(4):336-40. doi: 10.5301/JVA.2011.8827.

Pre-operative regional block anesthesia enhances operative strategy for arteriovenous fistula creation.

Reynolds TS[1], Kim KM, Dukkipati R, Nguyen TH, Julka I, Kakazu C, Tokhner V, Chauvapun JP.

Author information

Abstract

PURPOSE: We aim to assess the effect of regional block anesthesia on vein diameter, type of AVF placement, and fistula size and flow volume.

METHODS: 30 patients presenting for AV access procedures were followed prospectively. Vein diameters via venous ultrasound and planned location for AV access were documented. Supraclavicular brachial plexus block was followed by repeat ultrasound and alterations in operative plan were noted. Patients returned to clinic for duplex ultrasound assessment.

RESULTS: Average increase from baseline vein diameter with regional block was most pronounced in the lower cephalic (34%), upper cephalic (24.2%), and basilic veins (31.3%) and less in the brachial vein (8.7%). Type of AVF was modified following regional block in 14%. The rate of native AVF placement improved from 89% to 93% with regional block. Twenty-three AVF patients were available for follow-up (mean 24 weeks). Average fistula size was 7.9 mm (CI 6.9-8.9) and all patent fistulas developed flow volume >600 mL/min. Primary patency was attained in 83%. One thrombosis occurred after a basilic artery was lacerated during dialysis access. The average fistula increased 0.33 cm from post-block diameter (SD 0.22, P<.05).

CONCLUSIONS: Vein diameter increases significantly in the basilic and cephalic veins following regional block anesthesia and may improve the rate of native fistula placement. Propensity to dilate after regional block anesthesia does not predict size of the fistula.

Anestesia loco-regionale

Effetto emodinamico intra-operatorio: dilatazione arterie con↑ flusso

Reg Anesth Pain Med. 2012 Jan-Feb;37(1):111-8. doi: 10.1097/AAP.0b013e318234007e.

Regional hemodynamic changes after an axillary brachial plexus block: a pulsed-wave Doppler ultrasound study.

Li J[1], Karmakar MK, Li X, Kwok WH, Ngan Kee WD.

⊕ Author information

Abstract

BACKGROUND: Brachial plexus block (BPB) causes vasodilatation and an increase in blood flow to the ipsilateral upper limb. However, no reports have comprehensively evaluated the regional hemodynamic changes after a BPB.

METHODS: Eight healthy adult patients who were scheduled for elective hand surgery had an ultrasound-guided axillary BPB for anesthesia. Regional hemodynamic parameters were measured in the ipsilateral brachial artery, using pulsed-wave Doppler (PWD) ultrasound before the block (0 minute) and at regular intervals for 30 minutes after the block. Skin temperature on the dorsum of the ipsilateral hand was also recorded at the same time intervals. Regional hemodynamic parameters that were measured in the brachial artery included peak systolic velocity (PSV, cm/s), end-diastolic velocity (EDV, cm/s), mean velocity (Vmean) and time-averaged mean velocity (TAVM, cm/s), ratio of PSV and EDV (S/D), diameter (d, cm), resistance index (RI), and pulsatility index (PI). Brachial artery blood flow (Q) was calculated as the product of TAVM and cross-sectional area.

RESULTS: The ultrasound-guided axillary BPB was successful in all the patients studied. The earliest change after the BPB was a change in the morphology of the PWD spectral waveform from a triphasic to a monophasic waveform and an elevation in the diastolic blood flow velocity. Over time, there was also a significant increase in PSV, EDV, Vmean, TAVM, d, brachial artery blood flow, and skin temperature and a decrease in S/D ratio, RI, and PI. Most of these changes were seen as early as 5 minutes after the block. The increase in EDV (3.7-fold) was the most notable change, and it was greater ($P < 0.05$) than the increase in PSV (1.5-fold) and Vmean (2.8-fold).

CONCLUSIONS: Regional hemodynamic changes that occur after an axillary BPB include a change in the morphology of the PWD spectral waveform, arterial vasodilatation, an increase in blood flow velocity, and an increase in blood flow through the ipsilateral brachial artery.

Anestesia loco-regionale

Effetto emodinamico intra e post operatorio prolungato

J Vasc Access. 2012 Jul-Sep;13(3):296-8. doi: 10.5301/jva.5000044.

Assessment of long-term vasoplegia induced by brachial plexus block: a favorable effect for hemodialysis angioaccess surgery?

Pirozzi N[1], Pettorini L, Scrivano J, Giuliani A, Baldinelli M, Punzo G, Pirozzi V, Menè P.

⊕ Author information

Abstract

PURPOSE: Loco-regional anesthesia, along with the neurosensitive inhibition causes arterial and venous vasodilatation, that could be of interest for vascular access surgery. We evaluated the long term vasoplegia persistence after brachial plexic block.

METHODS: Five patients submitted to brachial plexus block for an orthopedic procedure have been observed. Both radial arteries, that of the blocked arm and the opposite as a control, were analyzed by ultrasound examination, at time 0 and 360 minutes after anesthesia induction. All patients were treated with the same anesthesiologic protocol: axillary approach, use of an electroneurostimulator, injection 10 ml of ropivacain 7.5% + 10 ml of mepivacain 2%. The parameters evaluated from the arterial ultrasound flowmetry were: peak systolic velocity (PSV), end diastolic velocity (EDV) and resistance index (RI).

RESULTS: No modification of the arterial flow were observed in the control arm at 0 and 360'after block induction. The blocked arm instead showed a significant decrease of the resistive index, stable at 360 minutes.

CONCLUSIONS: The vasoplegia accompaning plexic block lasted 6 hours after anesthesia induction. Whereas this longstanding haemodynamic effect is beneficial for early patency of vascular access for hemodialysis, needs to be ascertained by further investigations.

Anestesia loco-regionale

Miglioramento degli outcomes

Lancet. 2016 Sep 10;388(10049):1067-1074. doi: 10.1016/S0140-6736(16)30948-5. Epub 2016 Aug 1.

Effect of regional versus local anaesthesia on outcome after arteriovenous fistula creation: a randomised controlled trial.

Aitken E[1], Jackson A[2], Kearns R[3], Steven M[4], Kinsella J[3], Clancy M[2], Macfarlane A[3].

⊕ Author information

Abstract

BACKGROUND: Arteriovenous fistulae are the optimum form of vascular access in end-stage renal failure. However, they have a high early failure rate. Regional compared with local anaesthesia results in greater vasodilatation and increases short-term blood flow. This study investigated whether regional compared with local anaesthesia improved medium-term arteriovenous fistula patency.

METHODS: This observer-blinded, randomised controlled trial was done at three university hospitals in Glasgow, UK. Adults undergoing primary radiocephalic or brachiocephalic arteriovenous fistula creation were randomly assigned (1:1; in blocks of eight) using a computer-generated allocation system to receive either local anaesthesia (0·5% L-bupivacaine and 1% lidocaine injected subcutaneously) or regional (brachial plexus block [BPB]) anaesthesia (0·5% L-bupivacaine and 1·5% lidocaine with epinephrine). Patients were excluded if they were coagulopathic, had no suitable vessels, or had a previous failed ipsilateral fistula. The primary endpoint was arteriovenous fistula patency at 3 months. We analysed the data on an intention-to-treat basis. This study was registered with ClinicalTrials.gov (NCT01706354) and is complete.

FINDINGS: Between Feb 6, 2013, and Dec 4, 2015, 163 patients were assessed for eligibility and 126 patients were randomly assigned to local anaesthesia (n=63) or BPB (n=63). All patients completed follow-up on an intention-to-treat basis. Primary patency at 3 months was higher in the BPB group than the local anaesthesia group (53 [84%] of 63 patients vs 39 [62%] of 63; odds ratio [OR] 3·3 [95% CI 1·4-7·6], p=0·005) and was greater in radiocephalic fistulae (20 [77%] of 26 patients vs 12 [48%] of 25; OR 3·6 [1·4-3·6], p=0·03). There were no significant adverse events related to the procedure.

INTERPRETATION: Compared with local anaesthesia, BPB significantly improved 3 month primary patency rates for arteriovenous fistulae.

FUNDING: Regional Anaesthesia UK, Darlinda's Charity for Renal Research.

Anestesia loco-regionale

Miglioramento degli outcomes

Eur J Vasc Endovasc Surg. 2017 May;53(5):734-742. doi: 10.1016/j.ejvs.2017.01.025. Epub 2017 Mar 10.

Regional Versus Local Anaesthesia for Haemodialysis Arteriovenous Fistula Formation: A Systematic Review and Meta-Analysis.

Cerneviciute R[1], Sahebally SM[2], Ahmed K[1], Murphy M[1], Mahmood W[1], Walsh SR[1].

Author information

Abstract

BACKGROUND: Arteriovenous fistula (AVF) formation is the most common vascular access procedure for patients requiring haemodialysis. However, it is associated with high failure rates, influenced by vessel diameter and arterial inflow. Mode of anaesthesia may affect these factors, and subsequently AVF maturation rates.

OBJECTIVE: To perform a systematic review and meta-analysis to assess the effect of anaesthesia type for autologous primary radiocephalic or brachiocephalic AVF creation on subsequent fistula failure rates.

METHODS: The online databases of Medline, EMBASE, CINAHL, The Cochrane Database of Systematic Reviews, ClinicalTrials.gov, and Google Scholar as well as vascular and anaesthesiology conference abstracts were searched on August 1, 2016. Randomised control trials (RCTs) that reported the effect of anaesthesia type on subsequent failure rates during autologous AVF creation were included. Two independent reviewers performed methodological assessment and data extraction. Random effects models were used to calculate pooled effect size estimates. A sensitivity analysis was also carried out.

RESULTS: Four RCTs (286 patients) were identified with 286 autologous AVFs. There were 48 fistula failures. Most of the studies suffered from significant methodological flaws. There was a significantly lower failure rate among patients undergoing regional (12/143) compared with local (36/143) anaesthesia (OR 0.28, 95% CI 0.14-0.57). On sensitivity analysis, having excluded the most heavily weighted study, the results remained significant (OR 0.20, 95% CI 0.05-0.75).

CONCLUSIONS: The use of regional anaesthesia is associated with lower AVF failure rates when compared with local anaesthesia in patients undergoing primary forearm AVF formation for haemodialysis.

Anestesia Loco-regionale

Sicura: ENS / ecoguida

Vasodilatazione pre-operatoria: ottimizzazione del planning

Vasodilatazione intra/post operatoria: ottimizzazione degli outcomes

+

Possibilità utilizzo emostasi preventiva

Grazie

nicola.pirozzi@uniroma1.it

Sindrome da riassorbimento

Rara complicanza (tecnologia/esperienza ++)

Tossicita SNC --> ACC

Anesthesiology. 2003 Dec;99(6):1449-51.

Ropivacaine-induced cardiac arrest after peripheral nerve block: successful resuscitation.

Chazalon P[1], Tourtier JP, Villevielle T, Giraud D, Saïssy JM, Mion G, Benhamou D.

J Intensive Care Med. 2014 Mar-Apr;29(2):59-70. doi: 10.1177/0885066612445978. Epub 2012 Jun 24.

Intravenous lipid emulsion for the treatment of drug toxicity.

Ozcan MS[1], Weinberg G.

Author information

Abstract

Intravenous lipid emulsion (ILE) has emerged as a powerful antidote for the treatment of drug toxicity in the past decade. Initial efficacy of ILE was shown in the setting of local anesthetic systemic toxicity (LAST), but recent case reports suggest its consideration in a variety of other drug toxicities. In this review, we will summarize the experimental evidence as well as the clinical experience in using ILE as an antidote. Specifically, we will look at the evidence for using ILE in LAST as well as toxicity due to beta-blockers, calcium-channel blockers, and tricyclic antidepressants. We will also review the current dosing recommendations as well as potential side effects of ILE as an antidote.

LipidRescue™

Salvataggio Lipidico

TRATTAMENTO DELL`ARRESTO CARDIACO INDOTTO DA ANESTETICI LOCALI

ATTENZIONE: TENERE QUESTO PROTOCOLLO ATTACCATO ALLA SACCA DI INTRALIPID

Nel caso di arresto cardiaco indotto da anestetici locali non risposivo alla terapia standard, in aggiunta al protocollo di rianimazione cardiopolmonare, dovrebbe essere somministrato e.v. intralipid 20% nei seguenti dosaggi:

- **Intralipid 20% 1.5 mL/kg in 1 minuto**
- **Iniziare immediatamente dopo un'infusione alla velocità di 0.25 mL/kg/min**
- **Non interrompere le compressioni toraciche (i lipidi devono entrare in circolo)**
- **Ripetere il bolo ogni 3-5 minuti fino a 3 mL/kg di dose totale fino alla ripresa della circolazione spontanea**

Continuare l'infusione fino a che non si é raggiunta la stabilità emodinamica. Aumentare la dose a 0.5 mL/kg/min se la pressione arteriosa tende a diminuire

La dose massima raccomandata é di 8 mL/kg

pratica, nella rianimazione di un adulto di 70kg di peso:

Prendere una sacca da 500 ml di Intralipid 20% e una siringa da 50 ml.

Aspirare e somministrare subito 50 ml e.v. per 2 volte

Connettere la sacca di Intralipid a un set da infusione e somministrarla e.v. nei successivi 15 minuti

Ripetere il bolo iniziale fino a un massimo di altre due volte se non vi stata ripresa di circolazione spontanea.

Attenzione:
ricordarsi di ripristinare la sacca di Intralipid utilizzata

In caso di utilizzo di Intralipid nel trattamento di un caso di tossicità da anestetici locali, segnalarlo sul sito www.lipidrescue.org

Trad: Dr Luigi Montagnini **Ver: 06/07**