General Medical Procedures

Intravenous and Intraosseous Infusion (SEM General IV/IO Protocol)  
(LALS/ALS)

The purpose of this protocol is to outline indications and procedures for the establishment of intravenous lines or, when necessary, for intraosseous lines. Clearance to perform intraosseous infusion in the Washtenaw/Livingston Medical Control Authority will be accomplished by an inservice during orientation for new personnel provided by the ambulance service. The Medical Control Board office will be notified of all new clearances by the ambulance service.

Procedure for Intravenous Infusions:

A. Large veins such as in the proximal forearm or antecubital fossa shall be used in patients categorized as red or those whose condition may deteriorate to red. More distal veins such as those of the hand or distal forearm should be used on patients categorized as yellow. Placement of IV's in the areas of a joint (elbow, wrist) should be avoided whenever possible. If placed near a joint, the joint should be immobilized. External jugular may be used if necessary.

B. All ALS patients will have an IV attempted at the scene or enroute.

C. For patients in which the need for IV fluid is not anticipated, but for which medications might be needed start an IV saline lock. A Saline Lock may be substituted for an IV of Normal Saline, KVO.

D. IO cleared personnel may opt, after failed attempts at establishing an IV, to attempt an intraosseous infusion under special circumstances. See below.

E. Patients who are hypotensive or have the potential to become hypotensive, should have more than one IV established using large bore catheters with macro-drip tubing. Transport should not (for example, major trauma patients) be delayed to establish IV lines.

Procedure for Intraosseous Infusion:

A. Venous access via peripheral veins should be attempted prior to attempting intraosseous placement.

B. Attempts to establish venous access using the intraosseous approach should not delay transport of the patient.

C. Intraosseous lines should be used in life-threatening situations where venous access using peripheral veins has been unsuccessful. Such situations include:

   - Cardiac arrest
   - Shock
   - Severe burn injury with shock
   - Severe multiple trauma with shock
   - Status epilepticus

D. Contra-indications for the use of the intraosseous technique include:

   1. Osteogenesis imperfecta
   2. Osteoporosis
   3. Fracture of the bone
   4. If possible, placement at or near sites of infection or burns should be avoided.
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E. Sites for placement of an intraosseous infusion are as follows:
   1. Proximal tibia (tibial tuberosity)

F. Equipment:
   1. Alcohol and/or iodine preps
   2. Saline for irrigation
   3. IV administration set
   4. Tape
   5. 10 ml syringe
   6. Needle with trocar

Technique for Intraosseous Infusion

A. Prepare infusion set up.
B. Externally rotate and splint leg.
C. Palpate landmarks, identify insertion site.
D. Using aseptic technique, prepare site.
E. Puncture skin at right angle to bone.
F. Needle is directed down for tibial site and up for femur or medial malleolus.
G. Needle is rotated in a back and forth fashion until a loss of resistance occurs.
H. Position in the intramedullary space is confirmed in the following ways:
   1. Needle will stand without support
   2. After removing trocar and attaching 10 ml syringe to needle, blood/marrow mixture should be aspirated without difficulty.
I. Attach IV tubing to needle and begin administration.
J. Secure needle and tubing.
K. Observe for complications.
L. Notify Medical Control of successful placement and location.
M. Needle size, location and any difficulties with insertion should be recorded in the medical record.