

Appendix C- Lidocaine Serum Levels

Key Points

- ✓ *The measurement of lidocaine levels is rarely indicated.*
- ✓ The clinical utility of measuring serum lidocaine levels in pain management is limited due to lack of information regarding the interpretation of the levels and the time required to obtain results.
- ✓ The literature often reports levels in American units, not Canadian SI units. The conversion factor for American: SI is 1:4.25. So 2 mg/L = 2 micrograms/mL = 8.5 micromoles/L (SI units)
- ✓ It can take up to 7 working days to get results.

Pain relief

- There is some limited information that little pain relief benefit will occur with concentrations less than 6.375 micromoles/L (1.5 mg/L)¹
- There is a steep concentration-effect relationship curve, with pain scores abruptly decreasing over a range of 2.635 micromoles/L.
- The range providing optimal pain relief is thought to occur between 6.375-10.625 micromoles/L

Adverse effects/Toxicity

- Progressive toxicity occurs with increasing dose and serum levels:
 - 8.5-12.75 micromoles/L – perioral numbness, lightheadedness, nausea at upper end of therapeutic range.
 - From 17-25.5 micromoles/L metallic taste, increase in blood pressure, drowsiness and parathesis can occur
 - Greater than ~21.25 micromoles/L visual/auditory disturbances, muscle twitching, confusion, agitation, psychosis and dysarthria can occur
 - Greater than ~34 micromoles/L severe muscle twitching and myoclonus can occur
 - Greater than ~42.5 micromoles/L seizures, AV block, hypotension and subsequent cardiovascular collapse

Procedure for drawing serum lidocaine levels when indicated

1. Intermittent infusions – draw trough immediately prior to next dose
2. Continuous IV infusion- draw once you have reached steady state (8-12 hours) from contra-lateral limb
3. Continuous subcut infusion- draw 24-72 hours after initiation or increase in infusion rates.
4. Collect in red top tube & refrigerate
5. Send to BC Toxicology Lab in Vancouver

¹ Wallace MS, Dyck JB, Rossi SS, Yaksh TL. Computer-controlled lidocaine infusion for the evaluation of neuropathic pain after peripheral nerve injury. Pain 1996;66:69-77.