• liver

The **amide-type** local anesthetics that are used in dentistry and metabolized by the liver include:

- Lidocaine *(Xylocaine)*
- Prilocaine *(Citanest)*
- Articaine *(Ultracaine)*
- Mepivacaine *(Carbocaine)*
- Bupivacaine *(Marcaine)*
- Etidocaine *(Duranest)*

These anesthetics are metabolized by the **hepatic microsomal enzyme system,** with the exception of articaine, which is metabolized by serum esterases. The products formed **do not** have anesthetic actions and are excreted primarily in the urine as metabolites. These agents should be used with caution or not at all in patients with compromised liver function. **Note:** The most abundant urinary metabolite of **lidocaine** is 4-hydroxyxylidine.

Amides are **metabolized** by three types of reactions:

1. **Dealkylation** of the amino terminus
2. **Hydrolysis** of the amide bond
3. **Hydroxylation** of the aromatic ring

The amides vary in **protein binding.** Lidocaine and mepivacaine are bound moderately. Etidocaine and bupivacaine are highly bound. **Note:** Bupivacaine is more selective for sensory nerves than etidocaine.

Dental Anesthetic Preparations and Average Duration by Route

Product	Infiltration	Inferior Alveolar Block
Carbocaine 3% (Mepivacaine)	20 minutes	40 minutes
Citanest Plain 4% (Prilocaine)	20 minutes	2.5 hours
Citanest Forte w/epinephrine (Prilocaine 4% w/epinephrine 1:200,000)	2.25 hours	3 hours
Lidocaine 2% w/epinephrine(1:100,000)	60 minutes	90 minutes
Marcaine 0.5% w/epinephrine (Bupivacaine w/epinephrine 1:200,000)	> 60 minutes	5-7 hours
Articaine 4% w/epinephrine (1:100,000)	60 minutes	60 minutes

Note: Bupivacaine has the **longest duration of action** of any dental local anesthetic presently available.