For ‘greens’: Is there any reason not to endorse these as essential medicines for children?

**Bupivacaine**

Do these medicines meet a public health? **Yes**

The advantage of *bupivacaine* over other local anaesthetics is its longer duration of action (3–7 hours). It has a slow onset of action, taking up to 30 minutes for full effect. It is often used in lumbar epidural blockade and is particularly suitable for continuous epidural analgesia in labour. It is the principal drug used for spinal anaesthesia. CD - BNFC, 2006.

Are they registered for use in (all age categories of) children? **Yes?**

USA
Caudal block (with or without epinephrine):
  - Children: 1-3.7 mg/kg
Epidural block (or than caudal block)
  - Children: 1.25 mg/kg

Administration in children under 12 years of age is not recommended. (DRUGDEX, ANVISA).

Are they any unanswered/unexpected clinical issues with respect to effectiveness or safety? **No**.

Are there special requirements or training needed for safe/effective use? **Yes**.

*Bupivacaine* appears to be more cardiotoxic than other local anaesthetics. Cardiac arrest due to *bupivacaine* can be resistant to electrical defibrillation and a successful outcome may require prolonged resuscitative efforts. Martindale 33 ed., P.1306

Is not indicated in children under 12 years old. Should be used carefully in patients with serious hepatic disease and with cardiovascular problem. Some preparations contain sodium methabissulfite as a preservative causing hypersensibility mainly in asthmatics. Accidental intravenous injection or high dosage for head and neck block can induce toxicity reactions (convulsions, cardio respiratory arrest).
Solutions containing preservatives should not be used for caudal or epidural block. Pediatric Dosage Handbook-American Pharmaceutical Association, 2001/2002 P. 159

Additional comments if any:

- administration in children under 12 years of age is not recommended
- bupivacaine spinal with dextrose not recommended in children under 18 years of age
- Administration of analgesic, Local: INTRAPLEURAL, continuous infusion 0.25% bupivacaine with epinephrine at 0.5 mL/kg/hr
- Administration of analgesic, Regional: (body weight 10 kg or less) CAUDAL, single dose 1-1.25 mg/kg as a 0.125% or 0.25% solution
- Administration of analgesic, Regional: (body weight 10 kg or less) CAUDAL, continuous infusion 0.1-0.2 mg/kg/hr as a 0.1%, 0.125%, or 0.25% solution; MAX 0.2 mg/kg/hr
- Administration of analgesic, Regional: (body weight 10 kg or less) CAUDAL or EPIDURAL, single dose 1-1.25 mg/kg as a 0.125% or 0.25% solution
- Administration of analgesic, Regional: (body weight 10 kg or less) CAUDAL or EPIDURAL, continuous infusion 0.1-0.2 mg/kg/hr as a 0.1%, 0.125%, or 0.25% solution; MAX 0.2 mg/kg/hr
- Administration of analgesic, Regional: (body weight greater than 10 kg) CAUDAL, single dose 1-2.5 mg/kg as a 0.125% or 0.25% solution
- Administration of analgesic, Regional: (body weight greater than 10 kg) CAUDAL, continuous infusion 0.2-0.4 mg/kg/hr as a 0.1%, 0.125%, or 0.25% solution, MAX 0.4 mg/kg/hr
- Anesthesia - Dental procedure: (12 y and older) 1.8-3.6 mL of 0.5% solution (9-18 mg) with epinephrine; a second dose (9 mg) may be administered; MAX total dose 90 mg
- Anesthesia for procedures on eye: (12 y and older) complete motor blockade, 2-4 mL (15-30 mg) of 0.75% solution
- Local anesthesia: INFLTRATION, 0.5 to 2.5 mg/kg as a 0.25% or 0.5% solution; MAX 1 mL/kg of 0.25% solution, 0.5 mL/kg of 0.5% solution
- Local anesthesia: SACRAL EPIDURAL BLOCK, (body weight greater than 10 kg) single dose 1 to 2.5 mg/kg as a 0.125% or 0.25% solution
- Local anesthesia: SACRAL EPIDURAL BLOCK, (body weight greater than 10 kg) continuous infusion 0.2 to 0.4 mg/kg/hr as a 0.1%, 0.125%, or 0.25% solution, MAX 0.4 mg/kg/hr
- Regional anesthesia: EPIDURAL, (body weight greater than 10 kg) single dose 1-2.5 mg/kg as a 0.125% or 0.25% solution
- Regional anesthesia: EPIDURAL, (body weight greater than 10 kg) continuous infusion 0.2-0.4 mg/kg/hr as a 0.1%, 0.125%, or 0.25% solution, MAX 0.4 mg/kg/hr
- Regional anesthesia: hyperbaric SPINAL (bupivacaine in dextrose formulation only), 0.3-0.6 mg/kg bupivacaine in dextrose as a 0.75% solution
- Regional anesthesia: PERIPHERAL NERVE BLOCK, 0.3-2.5 mg/kg as a 0.25% or 0.5% solution; MAX 1 mL/kg of 0.25% solution, 0.5 mL/kg of 0.5% solution

Details in DRUGDEX®
Adult Min/Max Dose: 75.0mg/400.0mg
Pediatric Min/Max Dose: 0.1mg/kg/11.1mg/kg

All Labeled Uses: Administration of Local Anesthesia, Local Anesthesia for Procedures, Major Nerve Block for Surgery, Regional Anesthesia for Surgery

Drug-Disease Contraindications
- Most Significant: Administration Site Infection
- Significant: Disease of Cardiovascular System, Myasthenia Gravis, Plasma Cholinesterase Deficiency
- Possibly Significant: Disease of Liver, Renal Disease

Revisão sistemática Cochrane: no one
Clinical trials: 27

Publication type: Journal Article; Randomized Controlled Trial

Publication type: Clinical Trial; Journal Article; Randomized Controlled Trial

Kokki H, Hendolin H. No difference between bupivacaine in 0.9% and 8% glucose for spinal anaesthesia in small children. Acta anaesthesiologica Scandinavica.4(5): 548-51.
Publication type: Clinical Trial; Journal Article; Randomized Controlled Trial

Publication type: Clinical Trial; Journal Article; Randomized Controlled Trial
Publication type: Clinical Trial; Journal Article; Randomized Controlled Trial

Publication type: Clinical Trial; Journal Article; Randomized Controlled Trial

Action proposed for the Committee to take: To approve
For ‘greens ’: Is there any reason not to endorse these as essential medicines for children?

Lidocaine

Do these medicines meet a public health? Yes

Are they registered for use in (all age categories of) children? Yes
USA, UK, AUST, BR

Are they any unanswered/unexpected clinical issues with respect to effectiveness or safety? No.

Are there special requirements or training needed for safe/effective use? Yes.

Additional comments if any:

Topical:
Apply to affected area as needed; maximum dose: 3mg/kg/dose; do not repeat within 2 hours.

Injectable local anesthetic:
Dose varies with procedure, degree if anesthesia needed, vascularity of tissue, duration of anesthesia required, and physical condition of patient; maximum dose: 4.5mg/kg/dose; do not repeat within 2 hours.


Maximum dosage without vasoconstrictor 4.5 mg/kg/dose in adults and children. With vasoconstrictor is 7 mg/kg/dose.


Local anaesthesia
By local infiltration

Neonate
according to nature of procedure, up to 3 mg/kg (0.3 mL/kg of 1% solution), repeated not more often than every 4 hours

Child 1 month–12 years
according to nature of procedure, up to 3 mg/kg (0.3 mL/kg of 1% solution), repeated not more often than every 4 hours

Child 12–18 years
according to nature of procedure, up to 200 mg, repeated not more often than every 4 hours

Gel, lidocaine hydrochloride 1%, net price 15 mL = £1.30; 2%, 15 mL = £1.30

Dose

Mucocutaneous anaesthesia
Child under 12 years
1–2 mL applied when necessary
Child 12–18 years
2–3 mL applied when necessary

**Ointment**, **lidocaine** hydrochloride 5%, net price 15 g = 88p

**Dose**

**Dental practice**
Child
rub gently into dry gum
Pain relief (in anal fissures, haemorrhoids, pruritus ani, pruritus vulvae, herpes zoster)
Child
1–2 mL applied when necessary; avoid long-term use

**Solution**, **lidocaine** hydrochloride 4%, net price 25 mL = £1.35

**Dose**

**Biopsy in mouth**
Child
up to 3 mg/kg with suitable spray or swab (with adrenaline if necessary); max. 5 mL

**Puncture of maxillary sinus or polypectomy**
Child
up to 3 mg/kg; apply with swab for 2–3 minutes (with adrenaline)

**Bronchoscopy and bronchography**
Child
up to 3 mg/kg; 2–3 mL with suitable spray


**Lidocaine** (lignocaine) is effectively absorbed from mucous membranes and is a useful surface anaesthetic in concentrations up to 10%. Except for surface anaesthesia and dental anaesthesia, solutions should not usually exceed 1% in strength. The duration of the block (with adrenaline) is about 90 minutes.


**Cautions**
lower doses in congestive cardiac failure, in hepatic failure, and following cardiac surgery; ECG monitoring should be carried out and resuscitation facilities should be available.

**Hepatic impairment**
manufacturer advises caution—increased risk of side-effects

**Renal impairment**
caution in severe renal impairment

**Pregnancy**
crosses the placenta but not known to be harmful in animal studies—use if benefit outweighs risk

**Breast-feeding**
amount too small to be harmful

**Contra-indications**
sino-atrial disorders, all grades of atrioventricular block, severe myocardial depression; porphyria

**Side-effects**
dizziness, paraesthesia, or drowsiness (particularly if injection too rapid); other CNS effects include confusion, respiratory depression and convulsions; hypotension and bradycardia (may lead to cardiac arrest); hypersensitivity reported


Use preservative free solutions for epidural or caudal use.

Action proposed for the Committee to take: **To approve**
For ‘greens’: Is there any reason not to endorse these as essential medicines for children?

Lidocaine + epinephrine

Do these medicines meet a public health? **Yes**

Are they registered for use in (all age categories of) children? **Yes**

USA, UK, AUST, BR

Use of vasoconstrictors

Most local anaesthetics cause dilation of blood vessels. The addition of a vasoconstrictor such as **adrenaline (epinephrine)** diminishes local blood flow, slows the rate of absorption of the local anaesthetic, and prolongs its local effect. **Adrenaline** must be used in a low concentration (e.g. 1 in 400 000–1 in 200 000) for this purpose and it should **not** be given with a local anaesthetic injection in digits and appendages; it may produce ischaemic necrosis.

When **adrenaline** is included the final concentration should be no more than 1 in 200 000 (5 micrograms/mL). In dental surgery, up to 1 in 80 000 (12.5 micrograms/mL) of **adrenaline** is used with local anaesthetics. There is no justification for using higher concentrations.

The total **dose** of **adrenaline** should **not** exceed 5 micrograms/kg (1 mL/kg of a 1 in 200 000 solution).


Use lidocaine concentrations of 0.5% or 1%(or even more dilute) to decrease possibility of toxicity; lidocaine dose (when using combination product of lidocaine and epinephrine) should not exceed 7mg/kg/dose; do not repeat within 2 hours.


Are they any unanswered/unexpected clinical issues with respect to effectiveness or safety? **No**.

Are there special requirements or training needed for safe/effective use?

**Lidocaine (lignocaine)** is widely used in dental procedures; it is most often used in combination with **adrenaline (epinephrine)**. **Lidocaine 2% with adrenaline 1 in 80 000** is a safe and effective preparation that has been used for many years.

In patients with severe hypertension or unstable cardiac rhythm, the use of **adrenaline** in a local anaesthetic may be hazardous. For these patients **prilocaine** with or without felypressin can be used but there is no evidence that it is any safer.

Great care should be taken to avoid inadvertent intravenous administration of a preparation containing **adrenaline**.

There is no clinical evidence of dangerous interactions between **adrenaline-containing local anaesthetics and monoamine-oxidase inhibitors (MAOIs) or tricyclic antidepressants**.

Do not use solutions in distal portions of the body (digits, nose, ears, penis), do not use large doses in patients with conduction defects (ie, heart block)
Use preservative free solutions for epidural or caudal use.

Additional comments if any:

Action proposed for the Committee to take: To approve