

Managing postoperative pain

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Introduction

Despite recent advances in our knowledge of "multimodal" analgesics therapies for pain relief^{1,2,3} many patients undergoing surgery continue to experience unacceptable levels of pain after their surgeries as postoperative pain is a complex and multi-factorial symptom which requires a considerate approach using a variety of treatment modalities to obtain optimal outcomes with respect to patient comfort and facilitating the recovery process. The approach to preventing postoperative pain involves administering a combination of opioid and non-opioids analgesics acting at different sites within the central and peripheral nervous system in an effort to eliminate side effects of each drug used.⁴

The effects of unrelieved pain have tremendous importance as it affects the well-being, comfort and postoperative course of surgical patients. It had never been simple to implement a proper management plan as the cost benefit relationship remained a formidable factor. The focus always had been on patient safety and a large number of patients are being handled globally with about 90% satisfactory outcome. But nevertheless an approach involving specially assigned staff, capital investment and running costs in order to achieve such outcome had incessantly controlled the management plan. It is felt that unless the least of such extra resources is made available, more intensive postoperative pain control may not get delivered.

As we all know, pain is a response to stimulus and is a product of biological function. It usually indicates the presence of pathology within the body but in postoperative pain it is the consequence of the surgery depending on its magnitude. The objective for postoperative pain management is to attenuate or eliminate

pain and discomfort with least side effects taking cost-benefit ratio into account. The management plan has to be need-based and individualized and the achievement is predicated on clinical, patient itself and local factors. The ultimate determinant of the satisfactory pain control will be patient's own perception of pain. However, it is generally agreed that if postoperative pain is not addressed at proper time or in proper manner the patient would be subjected to its adverse effect.⁵

Postoperative pain can affect all organ systems and includes

- Respiratory- Decreased vital capacity, decreased FRC, decreased tidal volume (Reduced cough, atelectasis, sputum retention and hypoxaemia, Chest infection, pulmonary embolism)
- Cardiovascular- Increased myocardial oxygen consumption and ischaemia (Tachycardia, Hypertension etc.)
- Gastrointestinal- Decreased gastric emptying, reduced gut motility and constipation
- Genitourinary- Urinary retention
- Neuroendocrine- Hyperglycaemia, protein catabolism and sodium retention
- Musculoskeletal- Reduced mobility, pressure sores and increased risk of DVT
- Psychological- Anxiety and fatigue

The effects listed above are the pathological consequences and these can further have secondary effects if not interrupted at some stage. However, as mentioned earlier the provision of effective pain relief during the postoperative period is dependent on in general on the following.

- Anaesthetic technique
- Type and extent of surgery
- Patient's perception of pain

The increased interests which currently fill the medical literature in improving

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Review Article

postoperative pain care is due to the wider availability of effective methods for pain relief, a growing awareness of beneficial effects of optimal postoperative pain relief as well as guidelines from authoritative national and international organizations. There is a social pressure and "consumer demand" from patients for better pain relief after surgery.⁶

Benefits⁷

In addition to improving patient comfort, the immediate postoperative course as well as long term outcome may be influenced by the quality of pain relief after surgery or trauma. The benefits may be charted as follows:

- Less physical and mental stress
- Improved motivation and ability for active mobilization
- Pulmonary functions improved; pulmonary complications
- Less stress on cardiovascular system
- Thrombo-embolic complications reduced
- Less impairment of gastrointestinal functions
- Urinary retention less
- Less impairment of immunological functions
- Fewer septic complications
- Reduced mortality in high risk patients
- Faster recovery after surgery
- Less chronic neuropathic pain
- Reduced health care costs

Assessment of pain⁸

Pain scales are tools that can help to diagnose or measure pain's intensity. The information provided can help the clinician to choose the best modality for the treatment. The most popularly used scales are verbal, numerical, visual, or some combination of all three forms:

Verbal: Verbal scales describe the intensity or severity of the discomfort. These are useful for it relative terminology and one must focus on the most characteristic quality of the pain.

Numerical: Numerical scales are to quantify the pain using numbers, sometimes in combination with words. This with the name "Visual Linear Analogue Scale" (VLAS) currently has gained wide use in pain practice.

Visual: Good for assessing pain in children who cannot communicate well.

Pain scales are best used as the pain is occurring for the sake of accuracy. With the continuation of the treatment, pain scales record how the pain is changing and if treatment is having the intended effect.

Verbal pain scale: Verbal scale describes the degree of discomfort by choosing one of the vertical lines that most corresponds to the intensity of pain felt. Clinicians can use this scale to determine if the recovery is progressing in a positive direction. But confounding results have been common especially with patients who have high anxiety level or very low threshold of pain.

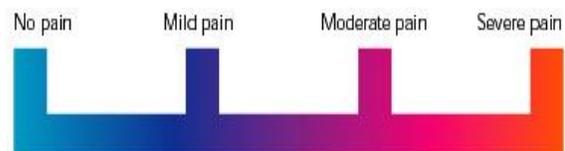


Figure 1: Verbal pain scale

Numerical pain scale (VLAS): A numerical pain scale describes the intensity of the discomfort in numbers ranging from 0 to 10 (or greater, depending on the scale). Rating the intensity of sensation is one way of expressing the discomfort due to postoperative pain.

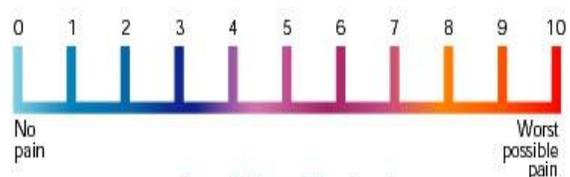


Figure 2: Numerical pain scale

Pain assessment in children or especially who cannot communicate can be difficult. Picture scales using varied facial expressions or by clinical observation (for example: sighing, groaning, sweating, ability to move) can be useful tools. The clinical assessment has the advantage of being independent of patient's cooperation to any great degree and can be carried out when other vital signs such as heart rate and blood pressure are being recorded. Few easy maneuvers like asking

Review Article

the patient to take a long deep breath or to cough or move may sometimes indicate the magnitude of the suffering. As mentioned earlier, measuring pain during rest and provision of analgesia on that basis often gives false positive outcome. It is, however, important that this is done when the patient is showing sign of distress and then a qualitative evaluation would provide some accuracy. Discomfort unrelated to the operating site may represent anxiety or generalized stress response and may act as confounders.

The early postoperative period presents special difficulty for any form of assessment so far described. Clinical signs (respiratory rate, haemodynamics etc.) are often the best guidelines under the circumstances. The assessment protocol should form part of the routine postoperative observations. The protocol should contain proper charts in graphical form rather than as a number. Supporting non-doctor medical staff should be trained and encouraged to use these tools of assessment of pain as a routine. Moreover, training should extend up to the administration of analgesics.

Visual scale: Visual scales show pictures of human body to help explain where the pain is located. A popular visual scale - the Wong-Baker Faces Pain Rating Scale- features facial expressions to help the clinician to understand how the pain makes the patient feel. This scale is particularly useful for children, who sometimes don't have the vocabulary to explain how they feel.

The Wong-Baker faces pain rating scale¹⁰: Designed for children aged 3 years and older, the Wong-Baker Faces Pain Rating Scale is also helpful for elderly patients who may be cognitively impaired. It offers a visual description for those who don't have the verbal skills to explain how their symptoms make them feel.



Figure 3: The Wong-Baker faces pain rating scale

If the patient is asleep, no further assessment is needed. If the patient is awake following is the protocol

Table 1: Pain assessment for children under four years

Cry	Not crying	Score 0
	Crying	Score 1
Posture	Relaxed	Score 0
	Tense	Score 1
Expression	Relaxed or happy	Score 0
	Distressed	Score 1
Response	Responds when spoken to	Score 0
	No response	Score 1

(Total score 1 as slight pain, 2 as moderate pain, 3 as severe pain and 4 as the worst pain possible)

Management

The plan of anaesthesia should always include postoperative analgesia and should be safe, effective and convenient. This starts with a discussion with the patient during pre-operative visit.⁹

Pain generally has been considered as a challenge for the clinicians. World Health Organization (WHO) however has dealt the issue globally and promoted a ladder attending 'pain' in general. The object of the WHO Analgesic Ladder was to control pain in patients with cancer. However, it has the potential for the management of acute pain as it has a logical strategy to pain management. The ladder has three steps; this along with VLAS may be used to address acute pain.

Analgesic ladder: The 'World Federation of Societies of Anaesthesiologists (WFSA) Analgesic Ladder' has been developed to treat acute pain in which post-operative pain can be included. The ladder initiates with severe pain that can be expected to be controlled with strong analgesics in combination with local anaesthetic blocks and peripherally acting drugs.⁹ The use of oral route for the administration of drugs may be limited because of the nature of the surgery and drugs may have to be given parenterally. Normally, postoperative pain should decrease with time

Review Article

and the need for drugs to be given by injection should cease. The second step on the postoperative pain ladder is the re-establishment of the use of the oral route for pain control. Strong opioids, now may pave the way for using combinations of peripherally acting agents and weak opioids. The final step is when the pain can be controlled by peripherally acting agents only.

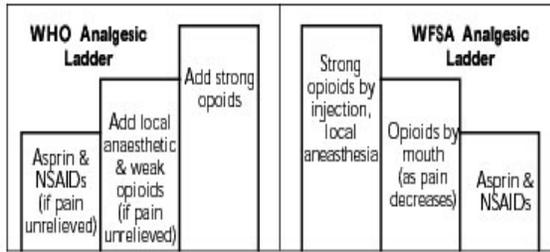


Figure 4: Analgesic ladder

The key to improving postoperative pain control and hasten recovery process, as suggested by many, is to use the "multimodal" approach in stages described above. It has indeed been considered as the benchmark for fast track clinical tool for acute pain by active workers in the field.⁴

The effective pain control is of singular importance to clinicians treating patients undergoing surgery. Although this should be achieved for humanitarian reasons, but there is now evident significant physiological benefit. Not only does effective pain relief mean a smoother postoperative course with earlier discharge from hospital, but it may also reduce the onset of chronic pain syndromes. But clinicians often find difficulty in managing mild and moderate pain and as the combination therapy described above is getting more popular. A 4 step ladder is given below which may solve some of the problems.

Therapeutic measures should follow the reported intensity of the pain through VLAS.

Table 2: Pain intensity grade

Pain intensity	Therapeutic measures
1-3 (slight pain)	Paracetamol (not exceeding 4G/day), NSAIDS with

	adjuvants (antidepressants, tranquilizers etc.)
3-4 (mild pain)	Combinations Paracetamol and NSAIDS
5-6 (moderate pain)	Paracetamol + NSAIDS + weak opioid or mu receptor agonist (Codeine , Tramadol etc)
7-10 (Severe pain)	Paracetamol+NSAID+Potent opioid (Morphine, Pethidine etc)

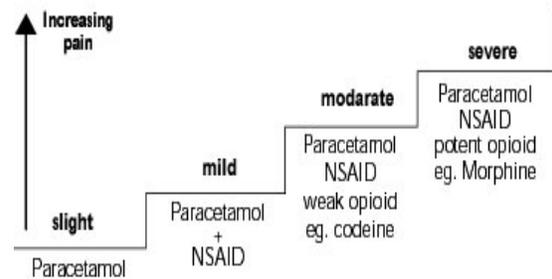


Figure 5:Analgesic ladder

Non-pharmacological methods of pain relief

- Preoperative explanation and education
- Relaxation therapy
- Hypnosis
- Cold or heat
- Splinting of wounds etc
- Transcutaneous electrical nerve stimulation (TENS)

Pharmacological methods of pain relief

Simple analgesia

- Paracetamol is a weak anti-inflammatory agent
- Modulates prostaglandin production in the central nervous system
- Can be administered orally or rectally
- Best taken on a regular rather than 'as required' basis.
- Overdose results in hepatic necrosis
- Often combined with weak opiates (e.g. dihydrocodeine, tramadol etc.)

Non-steroidal anti-inflammatory agents

- Inhibit the enzyme cyclo-oxygenase
- Reduces prostaglandin, prostacyclin and thromboxane production
- Also have weak central analgesic effect
- Often used for their 'opiate sparing' effects

Review Article

- Side effects include: Gastric irritation and peptic ulceration, Precipitation of bronchospasm in asthmatics, Impairment of renal function, Platelet dysfunction and bleeding, Ulcerogenic effects, Bronchospastic respiratory failure, Injection site pain/ tissue necrosis.

Table 3: NSAIDs⁹

Drug name	Forms available	Daily dose range	Half life(h)
Ibuprofen	Tablet, syrup	600-1200mg	1-2
Diclofenac	Tablet, suppository, injection, cream	75-150mg	1-2
Naproxen	Tablet, suspension, suppository	500-1000mg	14
Piroxicam	Capsule, suppository, cream, injection	10-30mg	35+
Ketorolac	Tablet, injection	10-30mg	4
Indomethacin	Capsule, suspension, suppository	50-200mg	4
Mefenamic acid	Tablet, capsule	1500mg	4

Paracetamol: It is mainly analgesic and antipyretic agent. Being well absorbed orally and is metabolised by the liver. Side effects are negligible if used judiciously and has been found to be most effective in mild pain. Overdose may cause hepatic damage. Doses range from a minimum of 500mg, to 4g, orally in adult.

Opiates

- Most commonly used drugs morphine and pethidine
- Diamorphine is a prodrug rapidly hydrolysed to morphine and 6-monoacetyl-morphine (may have a very restricted use)
- More lipid soluble than morphine with greater central effects
- Pethidine has only about 10% the analgesic potency of morphine
- All act on mu receptors in brain and spinal cord
- Mu 1 receptors are responsible for analgesia

- Mu 2 receptors are responsible for respiratory depression
- Side effects of opiates include: Sedation, Nausea and vomiting, Vasodilatation and myocardial depression, Pruritus, Constipation, Urinary retention, Respiratory depression, Urinary retention, Gastrointestinal motility reduced.

Routes of opiate administration

- Oral - Available for codeine, dihydrocodeine and oral morphine
- Subcutaneous - Useful for chronic pain relief but has been used postoperatively
- Intramuscular - Produces peaks and troughs in pain relief (Break through pain)
- Intravenous - Reliable but can produce sedation and respiratory depression
- Patient-controlled analgesia (PCA) - Patient determines own analgesic requirement
 - "Lock-out" period prevents accidental overdose
 - Safe as sedation occurs before respiratory depression
- Epidural or spinal
 - Lipid soluble opiates (e.g. fentanyl) are normally used
 - Produces good analgesia with reduced risk of side effects

Weak opioids⁹

Codeine: Weak opium alkaloids; markedly less potent than morphine, administered orally and treats mild to moderate pain. Combining with paracetamol provides better result without complication if maximum recommended dose is not exceeded. Doses range: (15 mg to 60mg 4 hourly with a maximum of 300mg daily). Doses range from 32.5mg (in combination with paracetamol) to 60mg 4 hourly with a maximum of 300mg daily.

Combinations of weak opioids and peripherally acting drugs: may be used in minor surgical procedures especially for outpatients: Paracetamol 500 mg/codeine 8 mg tablets. 2 tablets 4 hourly to a maximum of 8 tablets daily is considered as a good combination.

Table 4: Strong analgesics⁹

Drug name	Route of delivery	Dose(mg)	Length of Action(h)
Morphine	Intramuscular/subcutaneous	10-15	2-4
Methadone	Intramuscular	7.5-10	4-6
Pethidine	Intramuscular	100-150	1-2
Buprenorphine	Sublingual	0.2-0.4	6-8

* not readily available in the Bangladesh

(Intravenous - half the IM dose slowly over 5 minutes)

Systemic local analgesic agents: Lignocaine as a local anaesthetic agents is being widely used and still remains a strong choice in most of the settings, but the potential benefits of intravenous lignocaine in reducing postoperative pain has recently drawn attention.¹¹

Patient Controlled Analgesia (PCA)¹² is a system whereby patients could administer their own intravenous analgesia and so titrate the dose according to the need. This is achieved by using a small microprocessor - controlled pump. The patient has the control and can self-administer a small bolus dose of opioid and judging the benefit can organize the analgesic requirement. According to the severity of the pain. In theory, a steady state concentration in plasma can be obtained. Almost every opioid drug has been used for PCA, while the ideal drug should have rapid onset, moderate duration of action and a high margin of safety between effectiveness and troublesome side effects. PCA has been used intravenously and intramuscular, subcutaneous and epidural routes have also been practiced. The details of PCA delivery technique is beyond the scope of this article but in spite of the cost of the equipment it has been proved to be an effective way of handling acute pain. Less total amount of opioid is used with PCA than with intramuscular route. The reported side effects is about the same with the two techniques but PCA has less incidence of respiratory depression.

Table 5: Guidelines for patient controlled intravenous opioid administration⁹

Drug(cone)	Size of bolus(mg)	Lock-out interval(min)
Morphine(1mg/ml)	0.5 --2.5	5-10
Pethidine(10mg/ml)	0.5 --25	5-1
Methadone(not locally available)(1mg/ml)	0.5 --2.5	8-20
Fentanyl(1mg/ml)	0.01 --0.02	3-10

Local/regional anaesthetic techniques: Regional anaesthetic techniques are associated with possible better respiratory and cardiovascular effects, reduced blood loss and excellent pain relief. Technique that can be used for the surgery as well as postoperative analgesia may be considered near perfect. Following have been used.

- Local infiltration of incisions with long-acting local anaesthetics
- Blockade of peripheral nerves or plexuses and
- Continuous block techniques peripherally or centrally.

Postoperative analgesia may be used as a part of a prepared plan for overall anaesthetic management with appropriate analgesic drugs. Pain being multifactorial in origin should follow a management that consist of a combination of approaches in order to achieve the best results. Bupivacaine Infiltration of an incision line can provide effective analgesia for several hours. Pain relief beyond that can be obtained with intermittent administration or by infusions via a thin catheter. Selective analgesia in various parts of the body supplied by the plexus or nerves can be achieved by conduction blockade. These are especially considered where a sympathetic block is desired or central blockade is contraindicated.

After the reintroduction of spinal anaesthesia it has been found to be excellent analgesia for surgery in the lower half of the body and pain relief can last many hours postoperatively. Continuous spinal analgesia using catheter

Review Article

has been tried but epidural analgesia is more popular and safer. But performing epidural technique needs competence and back up service if continuous epidural infusion or patient controlled epidural analgesia (PCEA) is planned. A great deal of sterility care is mandatory for these techniques. A meta analysis of the epidural analgesia concludes that 'epidural analgesia, regardless of analgesic agent, location of catheter placement and type and time of pain assessment, provided better postoperative analgesia compared with parenteral opioids.¹³

Intrathecal and epidural opioids have become popular in wide variety of surgical procedures. Administration is easy and on the top of providing surgical anaesthesia for a stipulated period it can act as postoperative analgesic means for several hours. It can be an additional technique with general anaesthesia. It has been reported that as long as 24 hours' comfortable analgesia has been achieved after a single injection of intrathecal morphine.

But there are side effects with these routes of delivery. Nausea, vomiting, itching (which is much more common with morphine than other drugs) and urinary retention are the main ones. Possibility of respiratory depression can be a serious concern for the clinicians. Assuming that all patients are at risk of this occasional complication and a high level of care and vigilance needs to be adopted. High dependency or intensive therapy unit, however, would be right place to keep this patient if there is a concern. Prescribing any other narcotics to this group patient (receiving intrathecal or epidural opioid) is prohibited.

Opioid/local anaesthetic combinations are becoming quite popular and have been adopted by many clinicians in order to achieve a synergistic effect and also to minimize the severity of the side effects of either agent. Dilute concentrations of local anaesthetic agents have been used in combination with opioids and delivered by infusion through an epidural catheter.

Other routes of delivery Transdermal, inhaled and intranasal opioids are among the routes of drug delivery currently used.

Table 6: Local anaesthetics for the treatment of acute pain⁹

Agent	% solution for analgesic blocks	Duration (hours)	Max. single dose mg/kg. (Total mg in adults*)	% solution for infusion	Comments
Lignocaine					
Infiltration	0.5-1	1-2	7	-	Rapid onset. Dense motor block
Epidural	1-2	1-2	(500)	0.3-0.7	
Plexus or nerve	0.75-1.5	1-3	-	0.5-1.0	
Mepivacaine					
Infiltration	0.5-1	1.5-3	7	-	Rapid onset. Dense motor block Longer action than lignocaine
Epidural	1-2	1.5-3	(500)	0.3-0.7	
Plexus or nerve	0.75-1.5	2.4	-	0.5-1.0	
Prilocaine					
Infiltration	0.5-1	1-2	8.5	-	Rapid onset. Dense motor block Least toxic amide agent. Methaemoglobinemia > 600 mg
Epidural	2-3	1-3	(600)	0.5-1	
Plexus or nerve	1.5-2	1.5-3	-	0.75-1.25	
Bupivacaine					
Infiltration	0.125-0.25	1.5-6	3.5	-	Avoid 0.75% in obstetrics. Mainly sensory block at low concentration. Cardiotoxic after rapid IV injection
Epidural	0.25-0.75	1.5-5	(225)	0.0625-0.125	
Plexus or nerve	0.25-0.5	8-24+	0.125-0.25	-	
Chlorprocaine					
Infiltration	1	0.5-1	14	-	Lowest systemic toxicity of all agents. Motor/sensory deficits may follow intrathecal injection
Epidural	1.5-3	0.5-1	(1000)	0.5-1	

*For healthy patients with 1:200,000 adrenaline added to solutions. Maximum doses quoted should be reduced by 40% if solutions do not contain adrenaline. Much lower doses can be lethal if injected directly.

Table 7: Intrathecal and epidural opioids for treatment of acute pain⁹

Drug	Single dose (mg)	Onset(min)	Duration of single does (h)
Epidural			
Morphine	1-6	30	6-24
Pethidine	20-150	5	4-8
Methdone	1-10	10	6-10
Fentanyl	0.025-0	1.5	2-4
Subarachnoid			
Morphine	0.1-0.3	15	8-24+
Pethidine	10-30	?	10-24+
Fentanyl	0.005-0.025	5	3-6

Factors influencing the outcome

The site of the surgery has a great deal of role in terms of degree of severity of pain. Surgery on the thorax and upper abdomen are more painful than on the lower abdomen. Surgeries in peripheral areas however, are least painful as compared to its former counterparts. Any surgery involving a body cavity, large joint surfaces or should be regarded as painful. Surgeries on the thorax or upper abdomen deep tissues may affect pulmonary, cardiovascular and other function adversely as described previously. As the choice of analgesic techniques may be influenced by the site of surgery, it may also be influenced by drug availability and familiarity with different methods of analgesia. Patient-controlled analgesia (PCA) paradigm, has produced publications indicating higher frequency of PCA demands for morphine following surgery. This is where Infusion through epidural route has been proved to safer.

In the past, the standard method of treating postoperative pain in the developed world has been intramuscular opioid (usually morphine) although individual variation in terms of response had been apparent. The effects of opioid drugs vary greatly among patients and thus individual responses cannot be predicted resulting under-treatment of acute postoperative pain as the pain management staff overestimates the length of action and the strength of the drugs for one and the fear of complication for another. In spite of the above, other factors may alter the amount of pain suffered by the individual patient. The attitude of the patient in terms of individual personality, nature and intended purpose of the surgery may be important. Proposed surgery with a positive outcome may obviate the use of more analgesics as compared to a procedure with unfavourable or doubtful result. Patients who are afraid of anaesthesia or surgery may complain of more pain.

Certain drugs, such as morphine, which are the mainstay of postoperative pain relief in many places, are either not available or unduly costly. Patient-controlled analgesia (PCA.) devices are expensive and not

available in most of the centres in Bangladesh and that techniques of regional anaesthesia which employ continuous infusions through disposable catheters are not easy to introduce either. Techniques beyond local resources cannot be advocated for general use. It would be, however, advisable to maximise the effective use of local anaesthetic techniques and intermittent delivery of such analgesic drugs as are available.

Pain relief in children⁹

Postoperative pain in children is often under-treated although there is nothing to suggest that pain is less intense in neonates and young children due to their developing nervous system. This is done only for the fear that the potent analgesics are dangerous when used in children because of the risks of side effects if not addiction. Fear and anxiety of the patients are usual contributory factors and the treatment of pain needs to take that into account.

Pain assessment has always been difficult, especially in those patients who cannot explain and express in intelligible terms. Nevertheless, ignoring the presence of pain in children can be dangerous and the course is to assess the pain and the patients response to treatment as thoroughly as possible. Children over four are better patients and are able to translate pain if proper assessment are used.

Management of pain in children needs more care, attention and precision than in adults. Anticipation of pain postoperatively with its degree of severity is one of the clinical acumen as children are not best at pin pointing the problems but would ask for relief. One way is to follow a set protocol established on guidance from standards. Selection of route of administration will naturally depend on the drug to be used, the severity of the pain and the likely side effects. Oral route is by far the best if possible but rectal route is gaining popularity as it is well tolerated and vomiting is not a problem. The parenteral route should have its rightful indications.

Review Article

Local anaesthetic creams EMLA are available that can be applied under an occlusive dressing to produce numbness of the underlying skin for up to an hour. These may allow painless placement of venous catheters or infiltration of the area with local anaesthetic. Some procedures for pain relief can itself generate pain. This, of course needs extra attention.

Infiltration of local anaesthetic agent into the incision line before recovery from anaesthesia can reduce postoperative pain for long periods. This may act as pre-emptive analgesia allowing less amount of systemic analgesics in subsequent period. Day care patients are best suited for this. Caudal extradural anaesthesia provides excellent analgesia for any surgery below the waist such as herniorrhaphy, orchidopexy or circumcision. But the parents ought to be warned about some of the side like, urinary retention and of transient weakness or numbness.

*Dose schedule for caudal block with bupivacaine in children. 0.25% solution is satisfactory for blocks requiring a volume of 20ml or less. A more dilute solution (0.2% bupivacaine) should be used where volumes of 20 ml or more are required.*⁹

For short cases 1% lignocaine will be effective and the required volume can be calculated in a similar fashion.⁹

Table 8 : Doses schedule for extradural block

Type of block	Volume(ml/kg)
Lumbosacral	0.5
Thracolumbar	1.0
Mid-thoracic	1.25

Maximum doses of bupivacaine in any four hour period are 2-3mg/kg and for lignocaine 3mg/kg (without adrenaline), 6mg/kg (with 1:200,000 adrenaline).

Pain relief in the elderly

The geriatric group has special problems in the planning of pain management.

Communication and assessment may not be possible as a degree of dementia would be present. The choice of analgesic techniques is predicated on this factor. A little, however, will go a long way as their distribution volume for drugs is shrunk. Many are anxious and may give false signal necessitating a careful assessment. Assessment of pain, however, may be carried out by normal methods and conventional methods. Impairment of higher intellectual functions may need observational techniques similar to those described earlier. Inefficient absorption and metabolism and excretion is usual in elderly and care is advised. NSAIDS and opioids need special precaution if prescribed. Drug interaction has greater chance to occur as these group of patients are usually on varieties of medication.

Local anaesthetics Regional blocks are effective and quite satisfactory for postoperative pain relief. Intercostal nerve blocks are pulmonary function friendly after chest or upper abdominal surgery and pain below the waist can be abolished by epidural blockade. This also helps in prevention of ileus postoperatively. Epidural blocks have wider spread however and need reduction of doses. If proper precaution is taken regional blocks can be very effective in the elderly and give excellent analgesia postoperatively promoting quicker recovery and rehabilitation.

Conclusion

The postoperative pain control still remains an enigma as over the years changes in approach has taken place but no fool proof technique has been found so far. The multimodal techniques have been recommended by both American society of Anaesthesiologists (ASA) and World Federation of Society of Anaesthesiologists (WFSA) with an acceptable outcome. But the continuing quest for better strategies to confront postoperative pain should look beyond multimodal approach. Regardless of how the pharmacological armamentarium may change PCA with finer adjustments still seems to have a place in future. Transdermal application too seems a very potential

Review Article

technique as a non invasive effective method of treating acute pain.

References

1. White PF. Multimodal pain management - the future is now! *Curr Opin Investig Drugs* (2007); 8: 517-8 many patients undergoing surgery continue to experience unacceptable levels of pain after their surgeries.
2. Pavlin DJ, Chen C, Penazola DA, Polissar NL, Buckley FP. Pain as a factor complicating recovery and discharge after ambulatory surgery. *Anaesth Analg* (2002); 95: 627-34.
3. Chung F, Ritchie E, Su J. postoperative pain in ambulatory surgery . *Anaesth. Analg*(1997); 85: 808-16 .
4. White PF, Kehlet H, Neal JM , Schricker T, Carr DB, Carli F: Fast-track Surgery Study group. The role of the anaesthesiologist in fast-track surgery: from multimodal analgesia to perioperative medical care. *Anaesth Analg* 2007; 104: 1380-96.
5. Effects of postoperative pain 1 Cousins, 1994, Cousins M (1994) Acute and postoperative pain . In Wall PD & Melzack R (eds) *Textbook of pain* , 3rd edn. Pp 357-385 Philadelphia: Churchill_Livingstone).
6. Rosenbaum and Barash 1989, Rosenbaum SH & Barash PG (1989) Is anesthesia therapeutic ? *Anaesthesia and Analgesia* 69: 555-557.
7. Stouter et al 1994, Stouter AJ, Fredman B & White PF (1994) controversies in the perioperative use of nonsteroidal anti-inflammatory drugs. *Anesthesia and Analgesia* 79; 1178-1190).
8. Margo M and Chris P,: *Pain Clinical Manual*, 2nd Edition, 1999, p. 63.
9. Carlton E, *The Management of Postoperative Pain*, Practical procedures, Update in Anaesthesia, Issue 7, World Federation of Societies of Anaesthesiologists 1997, 2: 1-7.
10. Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: *Wong's Essentials of Pediatric Nursing*, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby.
11. Kaba A, Laurent SR, Detroz BJ, et al. Intravenous lignocaine infusion facilitates acute rehabilitation after laparoscopic colectomy. *Anesthesiology* 2007,106: 11-8.
12. Mcardle CS: Continuous and patient controlled analgesic infusions. In: Doyle E (ed) 1998 International symposium on pain control. London: RSM International Congress and symposium series No. 123: 17-22.
13. Block MB, Liu SS, Rowlings JA, et al . Efficacy of postoperative Epidural Analgesia, a meta analysis *JAMA* 2003; 290: 2455-2463.