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Chronic Pain Management in Children and Adolescents

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"When I hear a baby's cry of pain change to a normal cry of hunger, to my ears, that is the most beautiful music."
—Albert Schweitzer, 1903

Chronic pain in children is one of the most ignored and under-treated symptoms of disease. Over the last decade, there have been numerous studies in the literature that have addressed pain in children, its measurement and management. [1–3] In this issue of The Child's Doctor, I discuss chronic pain and its management in children. Recurrent or persistent pain is seen in 5–10% of children sampled randomly. The most common complaints of chronic pain in children include headache, abdominal pain, chest pain, neuropathic pain, back pain and cancer pain (Table 1).

TABLE 1
Chronic pain in children: common

Neuropathic pain
Reflex sympathetic dystrophy
Peripheral nerve injuries
Postamputation pain
Deafferentation pain
Headache
Cancer pain
Chest pain

Chest pain
Sickle cell crisis
Recurrent abdominal pain
Back pain

ASSESSMENT OF PAIN

Pediatric pain measurement has progressed substantially over the last decade. Ironically, in response to doubts that pain can be reliably measured in children, the intensity of pain measures have been thoroughly validated in pediatric patients.[3]

The gate control theory of pain is the most widely accepted model of pain.[4] It is, however, a physiological theory of pain transmission and does not explain psychosocial aspects of pain. The objectives of pain assessment are to:

- Detect the presence of pain,
- Estimate the potential impact of pain on the individual, and
- Quantify the success of intervention.

Several tools have been used for the assessment of pain in infants and younger children:

- Behavioral assessment

- Behavioral assessment involving
  - (i) Facial expression
  - (ii) Body movement
  - (iii) Behavioral state
  - (iv) Cry
- Physiological assessment of
  - (i) Cardiorespiratory parameters
  - (ii) Hormonal and neurochemical responses
    - — Increase in cortisol, glucagon,
    - — corticosteroids, catecholamines
    - — Increase in renin

In older children and adolescents, tools for the assessment of pain involve the patient in self- reporting pain.[5] We use several self-report measures that can be followed objectively for a prolonged period of time (Table 2).

TABLE 2

Self-Report Measures of Pain in Children

Measure	Description	Age Range	Advantages	Disadvantages
Faces Scale	Faces indicating intensity of pain	6-8 yrs	Adequate test/retest reliability	No validity tests completed
Visual Analog	Vertical line with numerical anchors	5 yrs & over	Reliable, valid & versatile Can relate in dimensions	Must understand proportionality

Oucher Scale	6 photos of children indicating pain	3-12 yrs	Presentations of pictorial & numerical range: broader age proportionality	Must understand concept
Pain Diary	Numerical rating along with time, activity medications, etc.	Adolescent	Useful in determining patterns of pain and self-teaching management strategies	Requires commitment

The visual analog score[6] and faces pain scale[7] are the measures we commonly use in the pain clinic. Self-report measures are very useful in determining precipitating and aggravating factors that cause pain in the older child or adolescent. These also allow us to assess patients for compliance and the viability of treatment regimens. All patients who are teenagers are encouraged to keep a pain diary. Using these measures, we have been able to predict patient pain tolerance and ability to cope with pain.

The diagnosis and management of some of the common chronic pain syndromes that are diagnosed in pediatric patients referred to Children's Memorial's Chronic Pain Clinic for management are discussed below.

COMPLEX REGIONAL PAIN SYNDROME 1 (CRPS 1 OR REFLEX

SYMPATHETIC DYSTROPHY)

Neuropathic conditions are those that are associated with injury, dysfunction or altered excitability of portions of the peripheral or central nervous system. CRPS 1 or reflex sympathetic dystrophy (RSD) is defined as "continuous pain in a portion of an extremity after trauma which may include fracture but does not involve major nerve lesions and is associated with sympathetic hyperactivity." This is often seen with any traumatic injury and presents as pain along with discoloration in a swollen extremity. The incidence of neuropathic pain is greater in teenage girls than in boys.[8] Due to the under-diagnosis of this syndrome in children, the reported incidence in pediatric population is less than in adults. Although RSD has been reported in a boy 3½ yrs, it is generally seen in children beyond the age of 9 and is more frequently seen in girls 11 to 13. RSD occurs particularly in girls of middle class families, commonly overachievers who participate in competitive athletic programs.[8] The appearance of this disease may be a method for a competitive athlete to exit gracefully from the sport. This explanation underscores the

psychological contribution to this disease state. Pain often persists despite the absence of ongoing tissue injury or inflammation.

TABLE 3

Comparison of Neuropathic and Nociceptive Pain

Characteristics	**Neuropathic Pain**	**Nociceptive Pain**
1. Description of pain	Burning, lancinating, pins & needles	Varied
2. Tactile allodynia	Present	Absent
3. Duration & intensity	Increases with duration	Decreases
4. "Opioid Resistance"	Present	Absent
5. Use of tricyclic antidepressants	Useful	Not useful

The mechanisms that generate neuropathic pain are varied and complex. Injuries to peripheral nerves may involve crush, transection, compression, demyelination, axonal degeneration, inflammation, ischemia, or other processes. The primary loci of increased irritability following peripheral nerve injury may be at several levels in the nervous system including axonal sprouts or neuroma, the dorsal root ganglia, the dorsal horn of the spinal cord, or sites more rostral in the central nervous system.[9,10] Although neuropathic pain has generally been regarded as

generally been regarded as psychogenic in children, it is also important to understand that neuropathic pain rarely keeps the subject from harm since it involves erroneous generation of impulses.

NEUROPATHIC PAIN

A detailed history of the nature of injury, the type and duration of pain, relieving and aggravating factors and the dependence on medications is mandatory prior to the evaluation.

Physical Evaluation

(1) Exam A thorough and systematic neurologic exam should be obtained. A complete evaluation of motor, sensory, cerebellar, cranial nerve, reflex, cognitive and emotional functioning is important. A concerted effort must be made to rule out the rare but possible malignancy or degenerative disorder.
(2) *Strength* The strength of the extremity should be evaluated on several occasions.
(3) *Allodynia* When innocuous stimuli like stroking elicit excruciating pain, this is very characteristic of neuropathic pain. Tactile allodynia in the absence

of skin problems signifies the presence of neuropathic pain.
(4) *Hyperalgesia* This refers to a situation when a patient has a decreased threshold to pain. Hyperalgesia to cold occurs more frequently than hyperalgesia to warmth. The distribution is generally not restricted to particular dermatomes as in adults and has a glove and stocking distribution.
(5) *Nerve conduction studies* These may give some insight into the location and type of nerve injury. However, the use of invasive electromyogram (EMG) may not be acceptable to children.

Diagnosis

Diagnosis is made usually on the basis of symptoms and signs (Table 4). A diagnostic test with phentolamine has been used to confirm the diagnosis of neuropathic pain and to predict the response to a sympathetic blockade.

TABLE 4

Symptoms & Changes with Various Stages of CRPS 1

Characteristics	Acute	Dystrophic	Atrophic
Pain	Hyperpathic and burning		Chronic

Blood flow	Increased	Decreased	No change
Temperature	Increased	Decreased	No Change
Hair and nail growth	Increased	Decreased	Chronic Change
Sweating	Decreased	Increased	No change
Edema	None	Brawny edema	Wasted muscles, atrophic skin
Color	Red	Cyanotic	Atrophic

Treatment

The management of neuropathic pain can be frustrating for the caregiver as well as the patient. There is no single therapy that can provide relief uniformly to these patients. Much of the management depends on the response to various clinical measures. The titration of medications is limited by the presence of side effects and complications. One of the main goals is to return the child to a functional state and back to school. Definitive resolution of the pain is not always possible. Most of the management techniques are extrapolated from experience in adult patients[11] (Table 5). It is important to gain the trust of the patient and their parents. Family dynamics are important, because the added burden of familial disharmony or parental abuse can increase the symptoms. There seems to be a

greater propensity for "enmeshment" in these families. The algorithm followed by the Children's Memorial Pain Clinic is shown here (Fig 1).

TABLE 5

Management of Neuropathic Pain

(1) Non-pharmacological treatment

— Offered to all patients

— hypnosis, biofeedback, visual guided imagery (psychologist)

— TENS and physical therapy

— Individual and family therapy

(2) Pharmacological therapy

— Acetaminophen, NSAIDs

— Tricyclic antidepressants, e.g., amitriptyline, nortriptyline, doxepin start low doses 0.1 mg/kg and advance slowly

— Anticonvulsant (carbamazepine, phenytoin, clonazepam), systemic local anesthetics (mexiletine, lidocaine)

— opioids (morphine, methadone given PO or IV or through a regional technique especially in cancer patients)

(3) Regional blockades for chronic pain

— Epidural, subarachnoid and sympathetic plexus blockade

— Sympathetic blockade for RSD

> 8 yrs under sedation

< 8 yrs under general anesthesia

Continuous catheter techniques may be used for 5–7 days

Epidural and subarachnoid block for cancer patients: left in place for longer periods by tunneling subcutaneously.

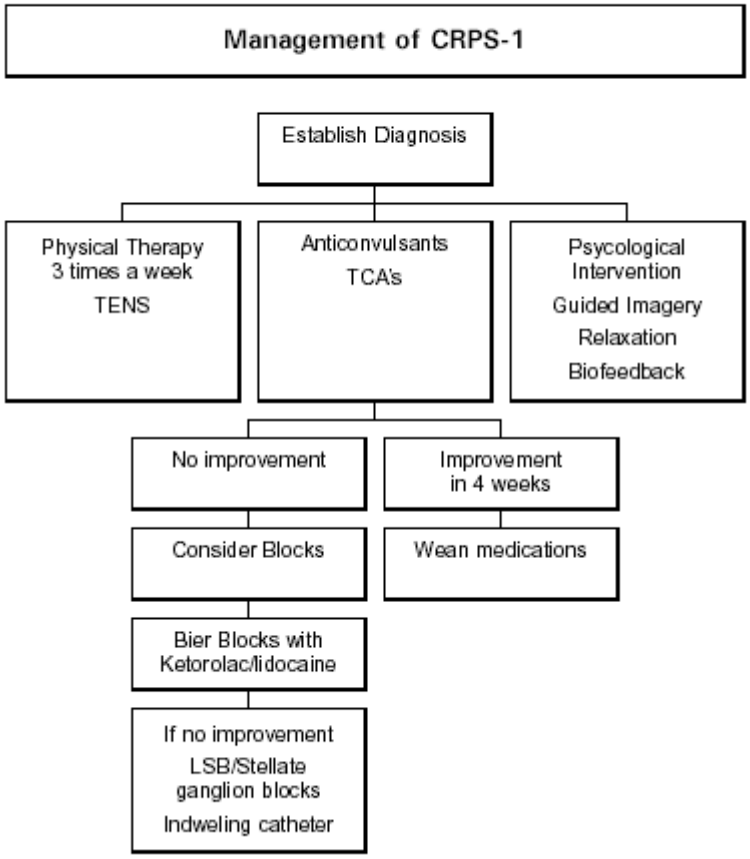
Neurolytic blockade for cancer

Behavioral measures are extremely useful in the management of neuropathic pain. Family therapy for the family to cope with the situation is usually very helpful.[12] We generally advocate a consultation

with the medical psychologist on the first visit to the pain clinic. We have used a number of techniques including biofeedback,[13] visual guided imagery and structured counseling regarding coping skills.

FIGURE 1

Algorithm for Management of CRPS-1



Physical therapy is an integral part of the management of these patients. TENS (transcutaneous electrical nerve stimulation)[14] is widely used, and its efficacy has been studied in adults as well as children. Good therapeutic benefits with the TENS unit in children with RSD have been reported by Kessler and

colleagues. Acupuncture is also helpful in these patients.[15] A dedicated physical therapist working with the pain management team has been essential.

Most of the information about medical therapy in children is extrapolated from the experience in adults. It is best to start with NSAIDs (nonsteroidal anti-inflammatory drugs) in moderate doses, followed by other medications. There are certain differences in adult and pediatric patients: Neuropathic pain may differ in children from that in adults in its presenting symptoms. There may be a difference in children's response to medication, and there may be unrecognized toxicity to medications.

SPECIFIC MEDICATIONS

Adults are frequently treated with tricyclic antidepressants (TCAs) for the management of neuropathic pain.[16] Despite the lack of adequately controlled pediatric studies, TCAs are widely prescribed for several forms of neuropathic pain. The choice of agents depends on the side effects. If the patient is unable to sleep at night, amitriptyline may be useful. On

the other hand, if the patient experiences considerable anticholinergic side effects like dry mouth and morning sleepiness, an agent such as nortriptyline or desimipramine can be used. A thorough examination of the cardiovascular system is necessary prior to instituting TCA treatment because of associated tachydysrhythmias and other conduction abnormalities of the heart, particularly the prolonged Q-T syndrome.

Some children appear to benefit from the use of anticonvulsants for the management of neuropathic pain. Gabapentin, carbamazepine, clonazepam and phenytoin are the most commonly used. Regular monitoring of drug levels, blood counts, and liver function studies is recommended for these patients. Carbamazepine in particular has proven especially useful in managing neuropathic pain. More recently the use of gabapentin was shown to be very effective in the management of neuropathic pain.[17, 18]

Opioids can be helpful in the management of neuropathic pain, especially for cancer-related neuropathic pain. Arner and colleagues showed that there are

colleagues showed that there are several types of neuropathic pain that are resistant to the effects of opioids. They found that opioids reduce the emotional aspect of pain, rather than the sensory aspect of pain. It is optimal to titrate the narcotic in a graded fashion in order to optimize the effect. Sedation is a side effect that may be desirable and in some cases may need to be antagonized by the addition of amphetamines.[19] For those children with non-cancer-related neuropathic pain, it is desirable to try non-opioid techniques, including behavior modification, prior to initiating large doses of opioids. We prefer to use oral opioids like morphine, hydromorphone, methadone and oxycodone, with the doses titrated individually to suit each patient.

Several patients with RSD have benefited from the use of systemic vasodilators like prazosin, nifedipine or phenoxybenzamine. Overwhelming adverse effects of orthostatic hypotension often offset the efficacy of this therapy.

The most common treatment for the neuropathic pain syndromes is to provide interruption of the apparent pathologic reflexes by sympathetic nerve blocks. With

serial nerve blocks the patient should notice pain relief that increases with each block and prevents the pain from returning to its original level. If no symptomatic relief is obtained after two or three blocks, an alternate approach should be instituted. Concurrent physical therapy is indicated to improve range of motion and to improve function.

We prefer intravenous regional Bier blocks for the management of pain in RSD.[20,21] Using mild sedation, and after venous drainage of the extremity, a tourniquet is placed on the proximal end of the extremity. Intravenous local anesthetic with ketorolac is injected into a distal vein. The tourniquet is kept inflated for about 30 minutes and then slowly released. A single block has provided total pain relief in some patients in our pediatric pain clinic.[21]

An alternate approach to the management of the peripheral manifestations of neuropathic pain is to use adrenergic blocking drugs such as guanethidine or bretylium as an intravenous regional technique. Occasionally in the patient with upper extremity RSD, a stellate ganglion block may be necessary

to alleviate pain. Lumbar sympathetic blocks and epidural blocks with local anesthetics are resorted to if the initial Bier block with local anesthetic and ketorolac is not effective. Several sympathetic blocks at intervals of one to two weeks may be necessary in order to see improvement in symptoms.

Varni et al have reported uniform improvement among his series of patients in a prolonged program of physical therapy and inpatient rehabilitation programs.[22] Ashwal in a review concluded that the prognosis of childhood RSD is more favorable than that of adult RSD.[23] Out of the 55 children in Olsson's report, 33 reached complete remission with a single IV regional sympathetic block, 14 were improved, and in 7 the block had no effect. Neuropathic pain can be puzzling and frustrating and its evaluation and management require a strong alliance with the family and with the patient. A multidisciplinary approach with an algorithmic management using available techniques can be helpful.

HEADACHES IN CHILDREN

Few physicians discussed headaches in children until 1873 when William Henry Day, a

which William Henry Day, a British pediatrician, devoted a chapter to the subject of headaches in his book *Essays on Diseases in Children*.[24] In 1967, Freidman and Harms published much of the available data in the book *Headaches in Children*.[25] These early works have stimulated many subsequent papers dealing with headaches in children. Each year at least 80% of the population suffers from headaches. However, many child care providers do not think that children have an appreciable number of headaches. In a study of 9,000 children in Sweden, Bille reported a headache report incidence of 75% of children under the age of 15.[26] The difficulty for the practitioner arises from the fact that the headache may be functional. A thorough physical examination helps to determine the nature of the headache.

PATHOPHYSIOLOGY

The degree of headache is modulated by extracranial as well as intracranial structures (Table 6).

TABLE 6

Headache Pathophysiology

Pain Sensitive
Extracranial:

— Skin
— Subcutaneous tissue
— Muscles
— Mucous membrane
— Teeth
— Larger vessels

Intracranial:

— Vascular sinuses
— Larger veins
— Dura surrounding the veins
— Dural arteries
— Arteries at the base of the brain

Pain Insensitive

— Brain
— Cranium
— Most of the dura
— Ependyma
— Choroid Plexus

CLASSIFICATION

The classification of headaches is based on the presumed location of the abnormality, its origin, its pathophysiology, or the symptom complex with which the patient presents. The International Headache Society has recently updated its classification. By plotting the severity of a headache over time, headaches can be classified into five major categories (Table 7).

TABLE 7

Classification of Headaches: Differential Diagnosis

Acute

— Systemic illness
— Subarachnoid hemorrhage
— Trauma
— Toxins like lead or carbon monoxide
— Electrolyte imbalances
— Hypertension

— Hypertension

Acute Recurrent Headaches

— Migraine

Chronic Progressive Headaches

— Organic brain disease

— VP shunt malfunction

Chronic Nonprogressive Headaches

— Functional in quality

Mixed Headaches

A thorough questionnaire should be used routinely to evaluate headaches in children. Other specific questions about neurologic symptoms like ataxia, lethargy, seizures or visual impairments should be asked. Important medical problems like hypertension, sinusitis and emotional disturbances should be known and evaluated. A history of a severe headache without a previous history of headaches, pain that awakens a child from sleep, headaches associated with straining, change in chronic headache patterns or the presence of a headache with associated symptoms like nausea or vomiting suggest that a pathological origin to the headache is likely and has to be very carefully evaluated (Table 8).

TABLE 8

Examination for Headaches

General Physical Exam

— Blood pressure

— Careful skin exam for café au lait, adenoma sebaceum, hypopigmented lesions, petechiae

Neurological Exam

— cranial circumference measurement

— bruit on ausculation of the cranium

— tenderness in the sinuses or presence of occult trauma indicating an abused child

— funduscopic examination: optic atrophy, papilledema

— cranial nerve examination for the presence of damage

— mental status

— alteration in language skills

— alteration in the gait

Lab Tests

— EEG: very non-specific

— CT scan especially with contrast may be useful in determining vascular abnormalities

— MRI: best for delineating abnormalities in the sella turcica, posterior fossa & temporal lobes

— lumbar puncture is helpful in determining acute infectious causes

— psychological tests to determine if there is a psychological basis for the headache

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Patients with ventriculo-peritoneal shunts (VP shunt) with headaches that are not related to a shunt malfunction have done well in our clinic.

Headaches in children are a perplexing problem by itself. Several patients have been referred to us by the neurosurgery service for management of headaches not related to shunt malfunction. The presence of a ventriculo-peritoneal shunt may pose additional risk to the patient and a diagnostic dilemma for the care provider. These patients are also subjected to emotional and

psychological stress associated with chronic illness. Self-esteem and the will to excel in academics are altered to a great degree, too. The management of these children involves a multidisciplinary approach with the involvement of several specialties including anesthesiology, neurosurgery, neurology, psychiatry services and physical therapy. An aggressive approach to managing these children has led to a decrease in operative procedures, school absenteeism, number of visits to the hospital and to increased self-esteem.

We routinely review the patient's clinical status and computed tomography scans with the neurosurgeons. Once it has been confirmed by the neurosurgical service that the headaches are not related to increased intracranial pressure, the patient is scheduled for an outpatient evaluation in the Chronic Pain Clinic at Children's Memorial Hospital. The following information is obtained:

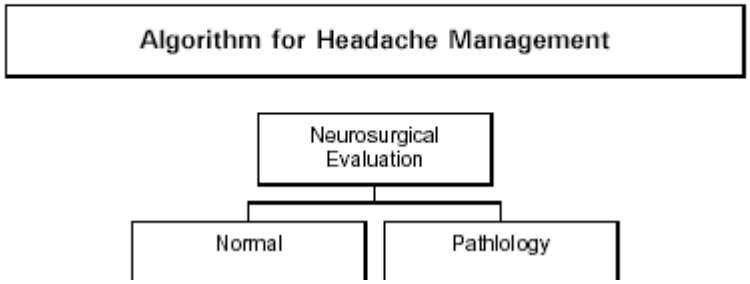
- Neurological status including a complete neurological exam
- Physical status of the patient (i.e., Is the patient actively mobile?)
- Do the headaches

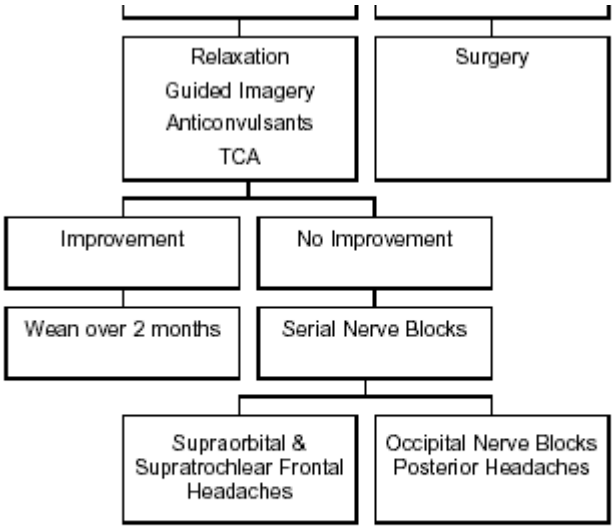
prevent the child from performing normal activities, e.g., interacting with others, participating in sports, etc.?
• Is there school absenteeism?
• What is the child's interaction with the parents and siblings at home?
• Are there any factors that relieve the headache?
• Has the child been treated with any medications for pain? Has there been any improvement at all in the clinical characteristics of pain?
• If there is a shunt, when was it last revised? Was the pain improved after the last shunt revision?

We then offer various interventions in a stepladder fashion based on the pain status. This is the algorithm that is followed by the Chronic Pain Clinic at Children's Memorial Hospital for management of headaches. (Figure 2)

FIGURE 2

Algorithm for Headache Management





Note: If the patient experiences nausea, vomiting and/or other signs of increased intracranial pressure, the possibility of vp shunt malfunction should be entertained in patients with shunts.

A number of patients who had been debilitated by headaches have been treated and have now resumed normal activity. Most of these children also had musculoskeletal problems. Hence the addition of physical therapy which has improved flexibility, increased muscle strength and also aided in the recovery of these patients. The intervention of a medical psychologist proficient in pain management has been vital to their recovery, not only by helping deal with family dynamics but also helping in the management of pain by teaching the patient coping mechanisms, visual guided imagery and biofeedback techniques.

CANCER PAIN

One of the most challenging

issues in pediatric pain management is the management of cancer pain, especially in the terminally ill patient. The management of pain in cancer patients requires the understanding of normal childhood development and the natural history and treatment of childhood malignancies.[27–29] Pain in a cancer patient can result from tumor invasion, procedures, therapy, or other causes unrelated to cancer.

Tumor invasion-associated pain can be recognized from knowledge of the natural history of the tumor in question. Bone pain is most common, usually related to a metastasis of the tumor to the bone. Other less common but very important reasons for cancer-related pain include compression of the spinal cord, tumor involvement of the central or the peripheral nervous system and viscus obstruction.

Procedure-related pain arises from bone marrow aspiration, lumbar puncture, venipuncture, etc. Its optimal management is important for the well being of the child and family and, in some cases, for the success of the anticancer treatment.

Therapy-related pain is related to the type of tumor and the

anticancer therapy that is being administered. The most commonly seen pain-related problems include mucositis, neuropathy, surgical incisions, corticosteroid-induced bone changes and gastritis from mucosal damage.

The evaluation of cancer pain requires assessment of the etiology and location of the painful source, qualitative features and intensity of the pain, anticipated course of the painful experience, i.e., the nature of clinical spread of the disease, the nature and efficacy of recent analgesic therapy, the available routes of administration of medication (i.e., central venous access), the psychological state of the child and the family, and an age-appropriate pain evaluation. The World Health Organization has suggested an analgesic stepladder protocol for the management of pain in cancer patients, as shown in Table 10. [30]

TABLE 10

World Health Organization Cancer Pain Management

Step 1 Non-opioids & adjuvants
↓ (If pain persists or increases)
Step 2 Weak opioids; Non-opioids & adjuvants
↓ (If pain persists or increases)
Step 3 Potent opioids and adjuvants

The analgesic intervention of a child with cancer-associated pain involves a multidisciplinary approach (Table 11). Multiple methods are available, but they should be chosen on the basis of the treatment modality in managing the pain and the effect it has on the child.

TABLE 11

Analgesic Intervention for Children with Cancer Pain

Anticancer therapy:
Radiotherapy
Chemotherapy
Biologic therapy
Surgery
Analgesic drugs
Non-invasive techniques:
Transcutaneous electrical nerve stimulation (TENS)
Physical therapy
Hypnosis
Biofeedback
Relaxation
Neurosurgical interventions
Regional nerve blocks
Supportive counseling

PAIN DURING TERMINAL ILLNESS

Treatment modalities for cancer and children have improved recently, partly due to a cure-oriented and technology-based health care system. Recently, with the involvement of organizations like hospices, principles of care of terminally ill children have been developed, based on the same philosophy as

adults.[31] Pain can be a significant problem in children who require terminal care.

Novel alternative methods for providing analgesia have been used by our pain service for children who do not have intravenous access. Nebulized opioids or the use of transdermal delivery systems have been used in children to offset intractable pain.[32,33] The adverse effects associated with long-term use of opioids include tolerance and withdrawal.[34] Careful rotation of opioids, along with the judicious use of other agents including N-methyl-D-aspartate (NMDA)-receptor antagonists, should be considered in their care.

Several approaches to pain management are taken based on the state of the patient, the involvement of the disease process, and the general state of the caregivers. Patient-controlled analgesia (PCA) has been used widely in our institution for home-bound patients with terminal cancer.[35,36] Smaller, more user-friendly pumps have been devised for easy programming and they require less frequent changing. In patients who do not have venous access we have recommended the use of subcutaneous PCA. A

number of other drugs are very useful in the terminally ill child. NSAIDs and steroids are particularly useful in the management of bone pain from metastasis.[37,38] Carbamazepine, gabapentin and tricyclic antidepressants (TCAs) are useful for the management of neuropathic pain.[39] Hypnosis, biofeedback and distraction techniques can be used very effectively in children who are not heavily sedated.[40–42]

A child's view of death is very different from that of an adult. There is a consistent progression of the conceptual aspect of death in children as they grow older. The school-age child finally understands the permanence of death. Home care may be very useful for the family to cope with grief and sorrow, and also allows other siblings to spend some time with a loved one. A home care coordinator should be available for the management of any adverse conditions. Knowing the family helps the coordinator understand their goals. One of the basic tenets of hospice care is to enable the patient to lead a full life, of the best possible quality, for the time remaining. Cooperation between the family and caregiver should allow the child to die with as much dignity

child to die with as much dignity as possible. It is the responsibility of the home coordinator to give the caregivers sufficient information on the management of pain. The combination of various techniques for the management of cancer pain should enhance the child's motivation and will to lead as normal a life as the disease state allows.

CONCLUSION

Pediatric pain is mostly a hidden problem. No attempt to meet a need can be begun until the need has been documented. Careful surveys of children in hospitals or in outpatient settings can yield data on prevalence and severity of pain for both professionals and policy makers. A standard of practice in pediatric pain is needed. With the understanding of pain in children and the presence of available professional help, more children can be helped by a chronic pain clinic.

A multidisciplinary approach to pain management helps determine the course of action and prognosis of the particular patient. When pediatric pain is severe, most management techniques include potent analgesics or the use of narcotics. There is considerable resistance

to the use of narcotics in children for fear of addiction or concern about respiratory depression. This may also pose an ethical dilemma to the nursing staff.[43] The use of various methods including physical therapy and the services of the child psychiatry/psychology department can help children cope and overcome persistent pain. Chronic pain can be devastating to a child's morale and should be treated the same way any other disease symptom is addressed. The key to excellent continuing care for these children is a multidisciplinary approach with a psychologist, physical therapist and a pain management specialist.

TABLE 12

Approaches to Pain Management in Terminally Ill Patients

Pharmacological
- — Opioid analgesics
- — Nonsteroidal analgesics
- — Steroids
- — Chemotherapy

Psychological
- — Support
- — Distraction
- — Hypnosis

Anesthetic
- — Regional anesthetics
- — Indwelling epidural and intrathecal catheters
- — Regional blocks

Surgical
- — Neuroablative procedures
- — Tumor debulking to reduce compression

Physical therapy

— TENS
— Acupuncture
— Heat/cooling
— Exercise

CHRONIC PAIN TREATMENT CENTER AT CHILDREN'S MEMORIAL HOSPITAL

A freestanding multidisciplinary pediatric pain treatment center at Children's Memorial Hospital is available for chronic pain patients. Three pediatric anesthesiologists, Drs. S. Suresh, M. Wheeler and A. Patel, who are additionally qualified in pain management, staff the clinic. We can be reached for consultation by contacting our nurse practitioners Jennifer Obrecht, RN or Vicki Andreoni, RN at 773-880-4006 or through the hospital operator at 773-880-4000 pager no. 4006. In addition, we have a dedicated staff psychologist, Sally Tarbell, PhD, who specializes in pediatric pain problems. The clinic takes a comprehensive, multidisciplinary approach to chronic pain problems in children and provides a child-friendly atmosphere to address issues that are frequently referred to adult centers. The clinic welcomes referrals from pediatricians and other physicians with children and adolescents with unresolved pain

adolescents with unresolved pain problems.

TO LEARN MORE...

...about the Department of Anesthesia and the Chronic
Pain Clinic at Children's Memorial Hospital, go to
www.childrensmemorial.org/depts/anesthesia/.

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