



## Drugs Used in Accidents and Trauma

Accidents and trauma are emergency situations needing immediate medical/clinical attention. Accident is an immediate incident, which results in an unplanned outcome. Some of which are predictable and preventable. Trauma kills and maims hundreds of thousands of individuals annually and costs society billions of dollars towards direct expenditures and indirect losses. Trauma is of different types depending on the origin of injury.

### PHYSICAL, PSYCHOLOGICAL AND MEDICAL

In many cases, physical trauma with serious body altering physical injury, leads to the removal of a limb. Psychological trauma is an emotional or psychological injury, usually resulting from an extremely stressful or life-threatening situation.

### MAGNITUDE OF THE PROBLEM (A FEW EXAMPLES)

- In the WHO European Region over 2000 people are killed; 60,000 others are admitted in hospital and 600,000 have emergency outpatient treatment every day through road traffic injuries, drowning, poisoning, falls, fires, self-inflicted injuries and interpersonal violence.
- In 2006 more than 100,000 people died, and an estimated 2,000,000 were seriously injured in road accidents in India. Road accidents account for 3% of India's GDP every year.
- The Center for Disease Control and Prevention's National Center for Injury Prevention and Control, in the US, has estimated **Traumatic Brain Injury (TBI)** affecting 1.4 million people with about 50,000 deaths. 80,000-90,000 people experience long-term disability and the economic burden was approximately \$37.8 billion in 1985.
- Increase in laboratory research has potential for accidental release of infectious agents. There are also concerns for malicious release of dangerous pathogens like the anthrax letters scare in the USA in 2001. There are health events resulting from chemical or nuclear accidents like the 1986 Chernobyl disaster, chemical contamination, accidents due to petrochemical waste, food adulteration (edible

cooking oil being adulterated with industrial rapeseed oil) and sudden environmental changes.

### EXAMPLES OF INJURIES

TBI causes substantial disability and mortality. It occurs when a sudden trauma damages the brain and disrupts normal brain function. TBI may have profound physical, psychological, cognitive, emotional, and social effects. Mood disorders, particularly depression are common in TBI. Treatment options for post traumatic depression include counselling, participation in support groups, and antidepressant medication. If drugs are used, their profiles including their adverse effects and interactions must be carefully considered to prevent worsening sedation or cognitive impairment.

**Spinal Cord Injury (SCI)** can lead to impairment of motor sensory, or autonomic function. Problems associated with patients with SCI included infection of the kidneys/bladder, kidney failure, pressure sores, and depression.

**Flail chest** often occurs secondary to crush injuries involving multiple rib and sternal fractures, resulting in significant disruption to the thoracic cage. As a result of this extremely painful condition, the patient is unable to breathe effectively because of pain and chest movement during inspiration.

In **neck trauma cases**, a single penetrating wound is capable of causing considerable harm because of a multitude of organ systems (eg, airway, vascular, neurological, gastrointestinal) get compressed into a compact conduit.

### PRIMARY SURVEY

The primary survey aims to identify and immediately treat life-threatening injuries. Its basis is the ABCDE system. This system comprises airway control with stabilization of the cervical spine, breathing (work and efficacy), circulation including the control of external hemorrhage, disability or neurologic status and exposure of the patient while protecting the patient from hypothermia.

### TREATMENT PRINCIPLES

Secondary brain injury symptoms commonly include

hypotension, hypoxemia, hypercarbia, fever, seizure, and uncontrolled hyperglycemia. Sound prehospital care has a significant impact on patient outcome. This involves adequate oxygenation and ventilation and the maintenance of an adequate cerebral perfusion pressure.

## TREATMENTS

**TBI:** A large, multicenter trial by Dr. Silver, D. Mirski, P. Reyes, P.D. Harvey, S. G. Potkin, and D. Arciniegas has shown rivastigmine is effective in treating moderate to severe memory loss in a subgroup of patients who have suffered TBI. Methylphenidate may hasten recovery after TBI. The positive effects of methylphenidate are improved speed in processing and sustained attention. By potentiating dopamine, amantadine may improve arousal, attention, and executive functions. According to Diane Schretzman Mortimer, etc, Hypertonic saline is an osmotic agent that can help patients in the acute phase of severe TBI.

## SPINAL CORD INJURY (SCI)

Current research is in molecular biology, gene therapy, and neural regeneration.

**Flail chest:** Care and control of airway, breathing, and circulatory accompanied by adequate pain relief. Treatment may include narcotic analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs). Adequate pain relief facilitates physiotherapy, coughing to permit airway clearance and maintains adequate respiratory function.

## CERVICAL SPRAIN AND STRAIN

Medically pain must be treated aggressively and appropriately. Acupuncture may be beneficial for pain control and should be administered by an appropriately trained and certified provider. **Nonopioid analgesics:** Non-narcotic analgesics ensure patient comfort. Eg. Acetaminophen. **Opioid analgesics:** These agents are indicated for the medical treatment of moderate to severe pain. Eg. acetaminophen. **Nonsteroidal anti-inflammatory agents:** These agents have analgesic, anti-inflammatory, and antipyretic activities. **Muscle relaxants:** These medications are indicated for the relaxation of increased muscle tone, spasm, and rigidity associated with cervical strain syndromes. **Tricyclic antidepressants:** Disturbed sleep is often a significant symptom with cervical strain. If analgesics and muscle relaxants do not provide enough relief, medications such as low-dose antidepressants can be used. **Corticosteroids:** These agents are used for severe inflammation. Eg. Methyl prednisolone

## NECK TRAUMA CASES

Recommended medications vary from penicillin to those with broad-spectrum coverage. Other therapeutic agents to consider are the corticosteroids. Antibiotics therapy must cover all likely pathogens in the context of the clinical setting. a) Gentamicin – Aminoglycoside antibiotic for gram-negative coverage, used in combination with both an agent against gram-positive organisms and one that covers anaerobes. b) Ampicillin – Alternative to amoxicillin when patient is unable to take medication orally. c) Clindamycin – For treatment of serious skin and soft tissue staphylococcal infections, also effective against aerobic and anaerobic streptococci (except enterococci). d) Ceftriaxone–

Third-generation cephalosporin with broad-spectrum, gram-negative activity; lower efficacy against gram-positive organisms; higher efficacy against resistant organisms.

## GENERAL CONSIDERATIONS

- **CT Scans in Trauma Diagnostics:** Physicians inform patients of the radiation risk associated with CT scans, especially in pediatric cases. Emergency department (ED) physicians should be aware of the additive risks of radiation exposure for CT scans over time.
- Develop a **treatment protocol** for patients and follow it.
- **Intensive care of the patient with polytrauma:** The specific task of the intensivist is to prevent and manage organ dysfunction.
- **Inadequate respiration** may result in hypoxemia, hypercarbia, cyanosis, depressed level of consciousness, bradycardia, or tachycardia. As a general rule, until stability has been assured, administer high-flow oxygen to all patients to help ensure adequate oxygen delivery.

## References:

- 1) Source: The World Health Report 2007 – A Safer Future
- 2) Injuries and Violence in Europe: Why they Matter and What Can Be Done, 2006
- 3) Percival H Pangilinan Jr, MD, University of Michigan Health System and others; <http://www.emedicine.com/pmr/TOPI213.HTM>
- 4) BBC News, June 10, 2008; <http://www.sajaforum.org/2008/06/india-india-lea.html>
- 5) Whyte J, Hart T, Schuster K, et al. Effects of methylphenidate on attentional function after traumatic brain injury. A randomized, placebo-controlled trial. *Am J Phys Med Rehabil.* Nov-Dec 1997;76(6):440-50.
- 6) Zafonte RD, Lexell J, Cullen N. Possible applications for dopaminergic agents following traumatic brain injury: part 2. *J Head Trauma Rehabil.* Feb 2001;16(1):112-6.
- 7) Caroline Cassels, Medscape, September 13, 2006; <http://www.medscape.com/viewarticle/544518>
- 8) Diane Schretzman Mortimer, staff nurse in the Neuro-Trauma Surgical Intensive Care Unit, Hennepin County Medical Center, Minneapolis; <http://www.medscape.com/viewarticle/548015>
- 9) Jason Lifshutz, M.D., and Austin Colohan, M.D., Department of Neurosurgery, Medical College of Wisconsin, Milwaukee, Wisconsin; and Division of Neurosurgery, Loma Linda University Medical Center, Loma Linda, California; <http://www.medscape.com/viewarticle/468461>
- 10) David Galler, MD, Clinical Director of Acute Care Services, Department of Intensive Care, Middlemore Hospital of Auckland, New Zealand, Adrian Skinner, Consulting Staff, Middlemore Hospital, Auckland, New Zealand; and Alex Ng, FRACS, Department of General Surgery, Auckland City Hospital; <http://www.emedicine.com/med/TOPI3218.HTM>
- 11) Decompression Sickness, <http://www.emedicine.com/emerg/TOPI121.HTM>
- 12) Cervical Sprain and Strain, <http://www.emedicine.com/pmr/TOPI28.HTM>
- 13) Neck Trauma, <http://www.emedicine.com/emerg/TOPI331.HTM>

*The focus theme for the next issue will be 'Fixed Dose Combinations'. We welcome readers to contribute. The future issues will be on Treatment of common skin conditions, Drug Food interactions – Timing & precautions, Treatment of Diabetes, Treatment of Asthma, Use of non-allopathic medicines.*

## NEW DRUGS

Though a number of combination formulations are approved by the Drugs Controller General India, for the prescriber it is the rationality of use that matters in practice. The following is the list of new drugs approved by the Drugs Controller General (India) between 8<sup>th</sup> August and 29<sup>th</sup> August 2006. In the previous issue we had published the new drugs approved upto 4<sup>th</sup> August 2006.

Sl. No	Name of Drug	Indication	Date of Approval
1	Erdosteine 150mg + Guaiphenesin 50mg + Terbutaline 1.25mg per 5ml syrup	Mucolytic	08.08.06
2	Rosiglitazone (as maleate)2mg + Glibenclamide 5mg + MetFormin 500mg tablet	Anti Diabetic	08.08.06
3	L- Lysine Hcl Ointment (150mg/gm)	For wounds of various etiology	08.08.06
4	Levocitirizine 2 Hcl 5mg+ Ambroxol Hcl SR 75mg + Pseudoephedrine Hcl 120mg SR Capsules	For SAR, PAR & Chronic idiopathic urticatia	09.08.06
5	Alprazolam SR 0.25mg + Sertraline (As Hcl) 25mg/50mg tablet	For Panic disorder with or without agoraphobia	09.08.06
6	Dexibuprofen 200mg/300mg +Paracetamol 500mg tablet	For RA, OA & ankylosing spondylosis	10.08.06
7	ISMN SR 60mg + Metoprolol Succinate ER 25/50mg	For angina & Hypertension	10.08.06
8	Aspirin 75mg / 150mg + Glycine 37.5mg/75mg tablet	For prevention of acute coronary syndrome in patients with CAD prophylaxis against stroke	10.08.06
9	Combipack of 21 tablet of Quinin sulphate 600mg each & 8 capsule of Doxycycline (as Hcl) 100mg each)	For P. Falciparum malaria	10.08.06
10	Pravastatin 40mg tablet (Additional strength)		10.08.06
11	Olanzapine powder For oral suspension (10mg/5ml)	For schizophrenia in adults	11.08.06
12	Cefepem (as Hcl) 0.5/1gm + Amikacin (as sulphate). 0.125/0.250gm Inj	Antibiotic	11.08.06
13	Lamivudine 20mg + Nevirapine 35mg + Stavudine 5mg tablet	Anti HIV	11.08.06
14	Nadifloxacin (10mg/gm) + Mometasone Furoate (1mg/gm) cream	For mixed infection of skin	17.08.06
15	Premetrexed(Disodium) powder For solution For Inj. 500mg/vial	Anti Cancer	21.08.06
16	Gliclazide 40mg/80mg + MetFormin Hcl 500mg + Rosiglitazone 2mg tablet	Antidiabetic	22.08.06
17	Tiropamide Hcl (100mg) tablet	For abdominal spasmodic pain, colics of hepatobilliary track, abdominal colics	22.08.06
18	Eperisone Hcl (50mg ) tablet	For neck-shoulder orom syndrome scapula hum oral per arthritis and low back pain	23.08.06
19	Caroverine cap. 20mg & Inj. 40mg/2ml	For abdominal pain & tinnitus in adult	23.08.06
20	Paclitaxel nanoparticle Inj. (20mg/ml)	For metastatic breast cancer	23.08.06
21	Amoxycillin 250mg + Dicloxacillin 250mg cap.	Anti biotic	28.08.06
22	Rifaximine 200mg tab.	For infections diarrhea in adults	28.08.06
23	Tigecycline powder For Inj. 50mg/vial	For skin & skin structure infection & intra abdominal infection	28.08.06
24	Stavudine SR 100mg tablet	Anti HIV	29.08.06
25	Cefixime (50mg/100mg) + Clavulanic acid 31.125mg/62.5mg per ml dry syrup & tablet	Antibiotic	29.08.06
26	Ciclsonide 80mcg/160mcg + Formotorol 4.5mg inhaler	Anti asthmatic	29.08.06
27	Ciclsonide 100mcg/ 200mcg/400mcg + Formotorol Fumarate 6mg rotacaps	Anti asthmatic	29.08.06
28	Abacavir Sulphate syrup 20mg/ml	For HIV Infection	29.08.06

## RATIONAL USE OF ARV MEDICINES

According to a NACO commissioned a study in 2007, among the 3 drug regimen/ combinations available in the Indian retail market, combination of Didanosine/ Lamivudine/ Efavirenz and Emtricitabine/ Efavirenz/ Tenofovir do not match the NACO guidelines. Besides, there are 2 drug regimen/ combinations like Zidovudine/ Lamivudine, Stavudine/ Lamivudine, and Ritonavir/ Lopinavir. Single drugs of Nevirapine, Efavirenz, Zidovudine, Lamivudine, Indinavir, Nelfinavir, Stavudine, Didanosine and Atazanavir are also available. Among private doctor prescriptions, over 50% do not conform to national guidelines.

The main reason for drug resistance is non-adherence to ARV therapy by doctors and non-compliance by patients, coupled with easily available ARV formulations in chemist shops. Emphasis on stigma drives patients towards private doctors in confidence rather than government hospitals. Strong advocacy programmes and regulation on rational use of medicines are necessary.

Disclaimer: Study by NACO was funded by WHO

Source: Abstract from AIDS 2008 Mexico  
by Dr. B.B. Rewari (Sr. Physician, RML Hospital &  
National Programme Officer (ART) National AIDS Control Organisation,  
and Dr R. Sweety Prem Kumar, Consultant New Delhi)

## ALERT

### FLUOROQUINOLONE TO KEEP BOXED WARNING ON TENDINITIS RISK

The US Food and Drug Administration (FDA) has notified manufacturers of fluoroquinolone antimicrobial drugs that a Boxed Warning in the product labelling concerning the increased risk of tendinitis and tendon rupture is necessary. This would serve as new safety information. The USFDA also determined that it is necessary for manufacturers of the drugs to provide a Medication Guide to patients about possible side effects. Use of this drug increases the risk of developing tendinitis and tendon rupture, particularly for certain patient populations,

A Risk Evaluation and Mitigation Strategy is necessary to ensure that the benefits of the drug outweigh the risks. The Medication Guide will be considered to be an element of the REMS. The new Boxed Warning and Medication Guide would strengthen warning information already included in product labelling for the fluoroquinolone class of systemic antimicrobial drugs.

The risk of developing fluoroquinolone-associated tendinitis and tendon rupture is further increased in people older than 60, in those taking corticosteroid drugs, and in kidney, heart, and lung transplant recipients. Patients experiencing pain, swelling, inflammation of a tendon or tendon rupture should be advised to stop taking their fluoroquinolone medication and to contact their health care professional promptly. The medications involved in this action are ciprofloxacin, ciprofloxacin extended release, gemifloxacin, levofloxacin, moxifloxacin, norfloxacin, and ofloxacin.

Source: Pharmabiz

### BOTULINUM TOXINS LINKED TO RESPIRATORY FAILURE AND DEATH

Botulinum toxin has been linked to serious adverse reactions, including respiratory failure and death. The most severe adverse effects were found in paediatric patients treated for limb spasticity associated with cerebral palsy.

The adverse reactions include difficulty swallowing, weakness, and breathing problems, and appear to be related to the spread of the toxin to areas distant from the injection site. The US Food and Drug Administration is conducting an ongoing safety review. Early findings suggest overdosing may be contributing to the adverse reactions.

The adverse effects occurred following treatment for both FDA-approved and nonapproved indications. In the United States, botulinum toxins are not approved for the treatment of limb spasticity in children or adults, though the FDA is aware of the body of literature describing this use. Until the FDA safety review is completed, the agency recommends that healthcare professionals who use medicinal botulinum toxins take certain precautions given by them.

SOURCE: US FDA [http://www.docguide.com/news/content.nsf/news/852571020057CCF6852573E9007D2907?Open Document & id=A2770AFD1ADD150 D 852573480025DCC0&c=&count=10](http://www.docguide.com/news/content.nsf/news/852571020057CCF6852573E9007D2907?Open+Document+&id=A2770AFD1ADD150+D+852573480025DCC0&c=&count=10)

## READERS FORUM

### An invitation

*Readers are invited to share/send ADR & Pharmacovigilance related problems observed/experienced with details of the concerned product.*

*We look forward for contributions from the readers to our next issue on, 'Fixed Dose Combinations'*

## Rational Drugs

A health education publication from the Policy Advocacy Group of CMAI.



Christian  
Medical  
Association of  
India

### Published by

The General Secretary, CMAI

All correspondence to:  
Policy Advocacy Group  
Christian Medical Association of India  
Plot No 2, A-3 Local Shopping Centre  
Janakpuri, New Delhi 110 058  
Phone: 2559 9991/2/3 or 2552 1502  
E-mail: [cmai@cmai.org](mailto:cmai@cmai.org),  
[cmaidel@vsnl.com](mailto:cmaidel@vsnl.com)  
website: [www.cmai.org](http://www.cmai.org)

CMAI Bangalore Office  
HVS Court, 3rd Floor, 21 Cunningham  
Road, Bangalore 560 052  
Tel: (080) 2220 5464, 2220 5837  
E-mail: [cmaibl@vsnl.com](mailto:cmaibl@vsnl.com)

### Editorial Committee

Dr Alice Kuruvilla  
Dr Sujith Chandy  
Dr Santanu K Tripathi  
Sr Jessie Saldanha  
Dr Vijay Aruldas  
Mr John Churchill  
Dr Abhijeet Sangma

### Editor

Dr R Sweety Prem Kumar

### Design & Production

Ms Susamma Mathew

Printed at: Impulsive Creations