SUMMARY AND CONCLUSIONS

Spinal cord injury (SCI) usually leads to devastating neurological deficits and disabilities. In addition, tremendous costs are imposed on community by the spinal cord injury. Traumatic Spinal cord injury can occur from trauma to the vertebral column or the spinal cord itself. Most spinal cord injuries are the result of trauma to the vertebral column causing a fracture of the bone, or tearing of the ligaments with displacement of the bony column producing a pinching of the spinal cord. The majority of vertebral fractures, do not cause any spinal cord damage; however, in 10-14% of the cases where a vertebral trauma has occurred, the damage is of such severity it results in damage to the spinal cord.

Traumatic Spinal cord injury primarily occurs in young men with the greatest number of injuries occurring in the 16-30 age group. Patients with a spinal cord injury are designated as having quadriplegia or paraplegia. quadriplegia refers to injuries to the cervical spinal cord and paraplegia refers to injuries below the cervical spinal cord. Patients with quadriplegia are slightly more common than patients with paraplegia. The majority of spinal cord injuries are sustained during a motor vehicle accident. Acts of violence are the second most common cause , falls are third and sports injuries are fourth .Traumatic Spinal cord injury can occur at any level of the spinal cord or at multiple levels; however, the most common area of injury is at the lower part of the neck at the C-4, C-5 and C-6 levels. if the injury is very severe it will lead to immediate death because the high level of injury interferes with breathing.

Trauma to the spinal cord initially causes hemorrhage, hypoxia and edema in the central gray matter, gradually increasing over several hours and extending peripherally from the center of the cord, and is dependent on the extent of the injury. The neurological damage that is incurred at the time of mechanical trauma to the spinal cord is called "primary injury". The primary injury provokes a cascade of cellular and biochemical reactions that leads to further damage. This provoked cascade of reactions is called "secondary injury".

A good neurologic examination, including a sensory and motor examination, is required to classify the level of injury. The classification standards endorsed by the ASIA is recommended for determining the level of injury. The neurologic level of injury is defined as "the most caudal segment of the spinal cord with normal sensory and motor function on both sides of the body." The injury is further classified as complete or incomplete and by the Anatomical Syndromes. They include the Central Cord Syndrome, the Brown-Sequard Syndrome, Anterior Cord Syndrome, Conus Medullaris Syndrome and Cauda Equina Syndrome .

The International Standards for Neurological and Functional Classification of Spinal Injury, endorsed by both the American Spinal Injury Association (ASIA) is recommended and attached for information.

Plain radiographs,Computed tomography and Magnetic Resonance Imagin MRI is best for suspected spinal cord lesions, ligamentous injuries, or other soft tissue injuries.

Management of spinal cord injuries starts before reaching hospital, in the form of adequate immobilization before and during transport to prevent active and passive movements of the spine. The measures includes placing on back board, head fixators, neck collars, in addition to maintaining patent airway and prompt fluid resuscitation. Stem cells represent natural units of embryonic development and tissue regeneration. Embryonic stem (ES) cells, in particular, possess a nearly unlimited self-renewal capacity and developmental potential to differentiate into virtually any cell type . Human ES cell lines, which have recently been derived, may additionally serve as an unlimited source of cells for regenerative medicine.

Rehabilitation is the process of restoration of function for persons with disorders of the nervous system. This process involves application of strategies aimed at reducing impairments, disabilities and handicaps, and ultimately enhancing quality of life for persons with neurological disorders. The practice of rehabilitation involves a team process, The patient is the ultimate target of treatment, but at the same time serves as a member of the team. Neurologists now are strongly involved in the practice of rehabilitation**.**

In persons with a complete injury, goals can usually be established on the day of the initial examination, since only about three percent of these patients later have recovery to an incomplete injury with minimal sparing. In persons with an incomplete injury, recovery is often much more difficult to predict. The person with any preserved motor movement often has fairly good prognosis. Recovery from spinal cord injury is, therefore, fairly predictable. Persons with a complete injury by neurologic examination generally are not expected to make any significant recovery except some improvement in motor strength in the zone of injury. Recovery for persons with an incomplete injury is less predictable and most recovery occurs within the first six months; however, some additional neurologic recovery may take place up to 18 months after injury. In a patient with a cauda equina injury, some recovery is possible through regeneration for up to three yearsfollowing spinal cord injury since it is a peripheral nerve type of injury.