

# BLAST INJURIES

## Treatment of Older Adults



### Background

Limited research is available regarding treatment of blast injury in older patients. Nearly all data on the patterns of injury and care of the victims of bombings are not focused specifically on older adults. However, lessons learned from day-to-day trauma and geriatrics care can provide insight into the treatment of blast injuries among older adults, including such considerations as the fact that older patients are especially subject to:

- An increased risk of fractures (e.g., hip, ribs, skull) as a result of decreased elasticity of tissues and organs, in addition to the decreased ability of organs to withstand rapidly applied strain forces;
- Traumatic brain injury; and
- Post-traumatic complications.

Additionally, outcomes are affected by co-morbid conditions, physiologic reserve, multiple concurrent injuries, pre-hospital care, medical/surgical interventions, and rehabilitation services. Some potentially significant co-morbidities include: coronary artery disease, hypertension, chronic obstructive lung disease, diabetes mellitus, dementia, cerebrovascular disease, chronic renal failure, arthritis, gastro-esophageal reflux disease, and anemia of chronic disease. Each of these conditions, along with the medications used for them, need to be taken into account when managing the care of an older blast victim.

### Clinical Presentation

- Physiologic derangements in older adults can be occult. They need to be aggressively pursued.
- Physiologic responses to hypovolemia seen in younger patients (e.g., tachycardia, hypotension) may not be seen in the older patients due to medications and preexisting diseases; intravascular volume status of many older adults can be difficult to assess and may require the early use of invasive monitoring.

### Diagnostic Evaluation

- The use of standard evaluation and resuscitation protocols (e.g., Advanced Trauma Life Support) is appropriate for initial evaluation and treatment of the older trauma patient.
- Because of natural changes in brain size with aging, older patients can sustain a significant amount of intracranial bleeding from a closed head injury before symptoms of increased intracranial pressure occur; early use of computed tomography (CT) scanning should be considered if head injury is suspected.
- A complete medication history, including use of prescription and non-prescription medications (herbal supplements, etc.), should be obtained and assessed for possible adverse effects and interactions. Commonly prescribed medications in older adults (e.g., beta-blockers, calcium channel blockers) can mask or blunt the normal physiologic response to injury and stress or, in some cases (e.g., warfarin), may exacerbate an individual's injuries.
- Flail chest (particularly anterior) may not be obvious in the older patient, and patients should be thoroughly evaluated for flail chest along with other serious chest injuries. Fractured ribs and/or chest wall contusion can be extremely painful and may be lethal if not managed aggressively.

## Diagnostic Evaluation (continued)

- Delirium is not uncommon, and it may be due to medications (including prescription and non-prescription), infections (e.g., pneumonia, urosepsis), or many other medical conditions, including: acute blood loss, electrolyte imbalance, end organ failure, hypoglycemia or hyperglycemia, hypoxia, arrhythmias, neurological conditions, dehydration, severe pain, immobility, sleep deprivation, fecal impaction, or urinary retention. During initial evaluation, patients with delirium should be assumed to have a reversible etiology until it is proven otherwise.
- Decreased hearing and visual impairment are common in older adults. These conditions need to be evaluated as contributing factors in patients with altered consciousness or cognitive change.

## Initial Management

- Pain, which can be manifested as delirium in older adults, should be optimally managed by balancing the need for relief and functional improvement with the potential for adverse events.
- Non-emergent or other non-life-threatening surgical procedures should be delayed for a brief period to maximize physiologic reserve and to manage co-morbidities.
- In the absence of any contraindications, perioperative beta-blocker use is appropriate for patients at high or intermediate risk of cardiac complications if such patients are undergoing emergent, vascular, head and neck, intrathoracic, intraperitoneal, or orthopedic surgery.
- All surgical patients older than age 60 years are considered at high risk of postoperative deep venous thrombosis and should receive prophylaxis.

## Disposition

- Social services, rehabilitation medicine, physical therapy, occupational therapy, nutrition, and pharmacology should be consulted early in the hospitalization of older adults, and early mobility should be encouraged post-operatively.
- Family members should be queried regarding existing advanced directives, and health professionals should assist family members in understanding how these directives relate to the specifics of medical care.
- Unrecognized dementia is a risk factor for post-operative delirium.
- Renal function should be determined by creatinine clearance (reduced with increasing age) and not merely by serum creatinine level. Medications that undergo renal excretion may need dosing adjustment when creatinine clearance is less than 60 ml/min.
- Measures to prevent skin breakdown should be evaluated on an ongoing basis.

*This fact sheet is part of a series of materials developed by the Centers for Disease Control and Prevention (CDC) on blast injuries. For more information, visit CDC on the Web at: [www.emergency.cdc.gov/BlastInjuries](http://www.emergency.cdc.gov/BlastInjuries).*