

TABLE 1-1: Types of Blast Injuries per DoDD 6025.21E

Injury Type	Mechanism of Injury
<p>Primary Blast Injuries:</p> <ul style="list-style-type: none"> • Blast lung • Ear drum rupture and middle ear damage • Abdominal hemorrhage and perforation • Eye rupture • Non-impact induced mTBI 	<p>Primary blast injuries result from the high pressures created by the blast. These high pressures, known as blast overpressure, can crush the body and cause internal injuries. Primary blast injuries are the only category of blast injuries that are unique to blast.</p>
<p>Secondary Blast Injuries:</p> <ul style="list-style-type: none"> • Penetrating ballistic (fragmentation or blunt injuries) • Eye penetration 	<p>Secondary blast injuries result when strong blast winds behind the pressure front propel fragments and debris against the body and cause blunt force and penetrating injuries.</p>
<p>Tertiary Blast Injuries:</p> <ul style="list-style-type: none"> • Fracture and traumatic amputation • Closed and open brain injury • Blunt injuries • Crush injuries 	<p>Tertiary blast injuries result from strong winds and pressure gradients that can accelerate the body and cause the same types of blunt force injuries that would occur in a car crash, fall, or building collapse.</p>
<p>Quaternary Blast Injuries:</p> <ul style="list-style-type: none"> • Burns • Injury or incapacitation from inhaled toxic fire gases 	<p>Quaternary blast injuries are the result of other explosive products (such as heat and light) and exposure to toxic substances from fuels, metals, and gases that can cause burns, blindness, and inhalation injuries.</p>
<p>Quinary Blast Injuries:</p> <ul style="list-style-type: none"> • Illnesses, injuries, or disease caused by chemical, biological, or radiological substances (e.g., “dirty bombs”) 	<p>Quinary blast injuries refer to the clinical consequences of “post-detonation environmental contaminants,” including chemical, biological, and radiological (e.g., dirty bombs) substances.</p>

- **The JIEDDO** supports development, maintenance, and usage of a joint database for collection, analysis, and sharing of information gathered or developed by DoD Components related to the efficacy of theater PPE and vehicular equipment designed to protect against blast injury; appoints representatives to the ASBREM COI and any other coordination, oversight or assessment board established by ASD(R&E) or the DoD EA; and assists the DoD EA, the ASD(R&E), and the ASD(HA) with identification of related operational and research needs, assessment of relevant research efforts, and coordination of planning to resolve capability gaps through focused research efforts.

DoD Framework for Characterizing Blast Injuries

The term “blast injury,” which is not limited to injuries resulting from a primary blast effect, includes the entire spectrum of injuries that can result from exposure to explosive weapons, ranging from non-impact induced mTBI and ear damage, to penetrating wounds, heat and chemical burns, and/or loss of limbs. DoD adopted the *Taxonomy of Injuries from Explosive Devices* as defined in DoDD 6025.21E in order to provide a common framework for characterizing the full spectrum of blast-related injuries; the EA is responsible for coordinating research and development for the entire spectrum. The *Taxonomy of Injuries from Explosive Devices* assigns blast injuries to five categories—Primary, Secondary, Tertiary, Quaternary, and Quinary—based on the mechanism of injury (Table 1-1).

Blast Injury Research Program Areas

The DoD Blast Injury Research Program addresses defined capability requirements and aims to close identified knowledge gaps associated with the prevention, mitigation and treatment of blast injuries. To address the full spectrum of capability requirements and knowledge gaps, current research efforts are