TRUEBEAM SYSTEM BUILT-IN SAFETY FEATURES

The TrueBeam™ system boasts multiple layers of safety for the patient, the system components, and the user. Among the system’s safeguards are physical, software, audible, and visual mechanisms specifically designed to help ensure safe operation of the equipment. These and TrueBeam’s other built-in features work together to help improve patient safety, while allowing clinicians to navigate the complexities of cancer care with confidence.

SAFETY HIGHLIGHTS

- Touch guards
- Capacitive collision detection system
- Machine motion model
- Zone rules
- Live view monitoring system
- Visual and audio monitoring system
- Standardized user interfaces
- Pre-treatment dry run capability
- LaserGuard II infrared laser collision detection system

The TrueBeam system includes safeguards such as the capacitive collision detection system (above left) and LaserGuard II infrared laser collision system (above right).
**Touch guards**
The TrueBeam system features collision detectors with touch guard sensors for machine components that may come within close proximity to the patient. These components include the kV imaging panel, kV imaging source, and the MV imaging panel, and if installed, the lower portion of the electron applicator(s).

**Capacitive collision detection system**
The capacitive collision detection system (CCDS) is a non-contact layer of safety that stops the motion of the kV imaging source if the active area is encroached upon.

**Machine motion model**
TrueBeam’s built-in equipment motion model provides a 3D representation of the mechanical aspects of the entire system and prevents component-to-component collision.

**Zone rules**
Zone rules are motion restriction safeguards which prevent hardware collisions. These built-in rules restrict any remote and some targeted motions from being performed during patient setup and treatment delivery if the system detects that a collision is possible.

**Live view monitoring system**
The live view monitoring system includes a radiation hardened camera focused on the patient. Directional arrows are projected onto the real-time image, located in the center of the treatment application monitor, indicating the targeted motions that are about to be executed. The system acts as a virtual presence, allowing therapists to remain focused on the patient.

**Visual and audio monitoring system**
Closed-circuit televisions enable the therapist to monitor the patient at all times. This “visual” safety mechanism affords the user ample coverage of the treatment room with pan, tilt, and zoom capabilities for optimal viewing. An integrated audio system built into the treatment control console enables constant interaction between the patient and therapist.

**Standardized user interfaces**
The pendants, couch side panel, and treatment control console are all icon driven and use the same optical indicators for consistency and ease of recognition.

**Pre-treatment dry run**
Dry run is used to verify motion clearance prior to executing a plan with beam delivery. The dry run functionality moves all TrueBeam external motion axes through their planned movements for the entire treatment, but does not deliver any dose to the patient. Dry run can be implemented as a motion review of the entire plan or a motion review of selected treatment fields and/or treatment field transitions.

**LaserGuard II**
LaserGuard II is an integrated patient and equipment collision detection system. The system uses an infrared laser scanning device that continuously monitors the contoured region between the collimator face and the patient. If an object enters its protection zone, then LaserGuard II stops or inhibits motion prior to a potential collision. This is particularly useful when performing remote gantry rotations, whether from the treatment console or during an automated treatment sequence.

LaserGuard II usability features include:
- Deactivation when treatment door is open for easy patient setup and automated re-activation when door is closed
- Automated activation when a patient is loaded into the system and during a dry run (when the dry run mode is selected)
- Remote clearance override of LaserGuard II, with the appropriate user rights, which allows motion to continue when the system is close to the patient
- Patient clearance and system usability are maximized through the design of the protection zone. The three-degree inclined protection zone plane includes a conformal notch contour which allows maximum clearance for patient treatment setup.
- Works with the machine motion model and touch guards

*Built-in safety features do not replace good clinical practice. Please consult your Varian representative with specific questions or concerns.*