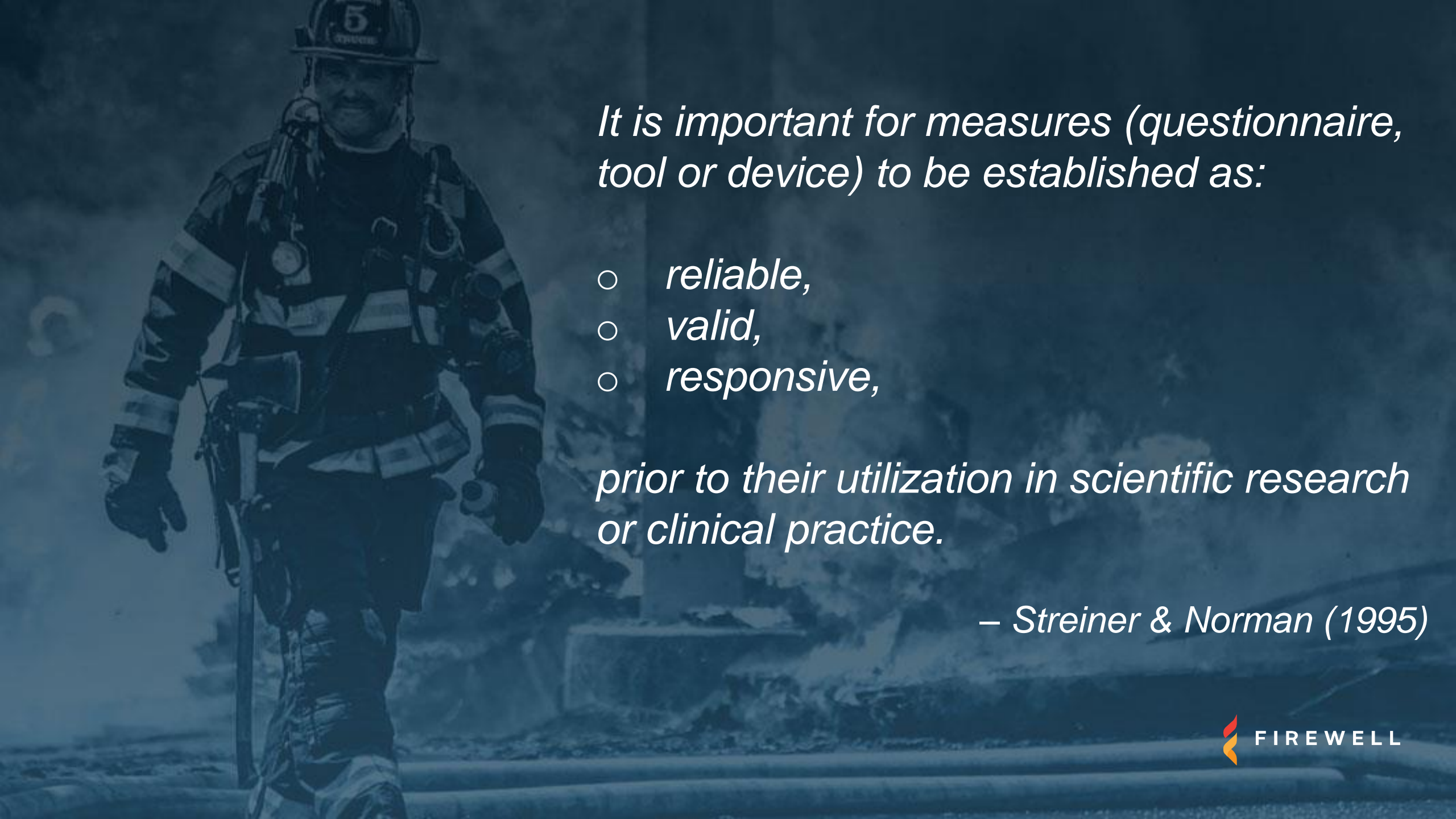




Measurement Properties

Reliability, Validity & Responsiveness

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It is important for measures (questionnaire, tool or device) to be established as:

- *reliable,*
- *valid,*
- *responsive,*

prior to their utilization in scientific research or clinical practice.

– Streiner & Norman (1995)

Measurement Properties

Reliability

- **Test-retest reliability:** When repeated measurements produce similar results in participants who experience no changes in conditions.

For example, a researcher measures a firefighter's resting heart rate on Monday, and again on Thursday using the same device under similar conditions.

- **Inter-rater reliability:** When measurements are taken by multiple observers or evaluators and they report consistent scores.

Example: A physiotherapist and a kinesiologist use the same work injury risk assessment tool to analyze a firefighter lifting a high-rise pack.

Measurement Properties

Validity

- Trueness of a measure.
- Ability of a device to measure what it is supposed to measure.
- Gold Standard device: provides the best measure [Electrocardiogram (ECG)].

Example: To assess the validity of the Zephyr BioHarness heart rate measure, the Zephyr was compared against ECC device, in healthy participants during a workout session. On average, the two devices reported similar heart rates throughout the workout.

Responsiveness

- The ability of a questionnaire, tool or device to detect change over time.

Example: A firefighter with a shoulder injury scores high (7/10) on a pain survey that was administered at an initial physiotherapy visit. After 3 months of rehabilitation, the firefighter scores (3/10) on the same pain survey



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