

# **Study of the Perceived Benefits & Liabilities of Use of Manikins vs. Live Patients in Rescue Training<sup>1</sup>**

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## **Abstract**

Many rescuers, like the author, have had the good fortune of training with multiple providers and trainers from varying backgrounds. Some trainers will rely heavily on students or other instructors as simulated patients when performing rescue training. Other trainers and institutions will adhere strictly to the use of manikins or lifeless simulated props to simulate patients that are being rescued.

Instructors and stakeholders will debate the benefits of each practice just as vehemently as rope users will debate belay systems. As a result of institutional / agency policies and informal conversations, most instructors harbor their own opinions and feelings on the issue. This research paper presents the findings of customers of a fire academy that hail from various backgrounds and walks of life. The two primary customer bases that will be surveyed are industrial and municipal fire. The survey will seek to assess and quantify the percentage of student population that prefer “live patients” or “manikins.” The survey will also identify whether students have participated in such training and how they perceived those experiences.

There is also a subjective component, which is intended to generate discussion, where students can make their case for or against the use of “live patients” or “manikins.” The end result of this study can be used to augment policy and decision-making of training providers. It will also identify points for further research. It is the hope of the author to determine if perceptions regarding this topic are divergent among industry customers and municipal fire customers. Other elements of study that would prove useful are whether how instructors respond to the survey vs. customers. As a final component, the author will make his interpretations of the findings and make recommendations for further research and publication.

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## **Problem**

For many training providers, utilizing live persons as victims in technical rescue training has become a normal practice. There are many obvious benefits of this practice. Other trainers or institutions are quite uncomfortable with this practice and will strictly utilize simulated victims. These may be human-looking manikins, fire hose dummies, grappling dummies, and other similar training aids. It is important to note that the scope or focus of this study applies to rope, confined space, other high angle, and some extrication training. It is not the intent to focus on live fire, collapse / crush, engulfment, or any training or simulation that could occur or develop into an atmosphere that is Immediately Dangerous to Life and Health (IDLH).

The instructors that spend the majority of their time delivering technical rescue training will be quick to offer justification for one philosophy or the other. Many instructors have had spirited conversations and debates with their peers or supervisors regarding these practices. Unless one catches that student's "deer-in-the headlights" look, while they are secured in a stokes basket making a difficult edge transition, most instructors do not assess the student population for their patient preferences in the training environment. Instructors are much more likely to employ their preferential or institutional style of training without due regard to the feelings or expectations of the student.

This exploratory study seeks to identify the disconnect between the two different instructional approaches of manikin-patients and person-patients; and how the student or customer feels regarding this practice. The study will help trainers better understand how to customize their programs to the customers' expectations. It will help illuminate other "noise" or concerns that contribute to a customer's or a trainer's perceptions and predispositions. The ability to mitigate the customer concerns should help increase their confidence in training.

It is important to list some of the perceived and commonly cited advantages and disadvantages of these two training philosophies. This will help to outline a loose

hypothesis as to how the respondents will respond. Some of the benefits of using manikins as patients in technical rescue training are:

- Safer / Limited liability in the result of the “catastrophic” system failure or collapse
- Limits potential for injury as patient is transported out of the hazard area (scrapes, bruises, injuries to extremities, etc.)
- Manikins unaffected by prolonged waiting and environmental exposures
- Some manikins can weigh less, thus become easier to “set” and rescue
- Manikins lack sensitivity when applying harnesses and fall arrest devices in personal areas, thus are rarely offended

Some of the benefits to using persons as patients include:

- Persons require rescuers to empathize with their patient and treat patient load as such
- Persons constitute a realistic weight and shape
- Manikins can be logistically challenging and cumbersome for instructors that train at the customer’s location
- Persons can offer feedback regarding comfort, patient considerations, timeliness, and other techniques.
- Persons can impart a sense of “urgency” and “thoroughness” on the rescue evolution.
- It is easier to “set” an ambulatory person into position to be rescued than a heavy manikin

These are some of the most evoked arguments for one practice or the other.

Instructors are sometimes reluctant to think outside of the box of cost / benefit for their customers. Some customers demand the rigorous, high-speed / low-drag, “train like you fight”, training experience. This is obvious. What about the customers that may be so preoccupied by fear that they are unable to enjoy training and retain information? The thought of participating as a patient may exacerbate this issue. Also, what about the customers that possess moderate skills and abilities, but do not trust their teammates that are tasked with establishing anchors and operating safety systems? If an instructor is not satisfied with the seriousness or diligence students are using with a manikin, is it

reasonable to “liven” the load in order to effect an attitude shift? This is yet another customer anomaly that exists. There are other case-specific scenarios that can dictate a need for the change of philosophies in both directions. As individual instructors, are the expectations and of the “manikins-versus-persons rescue philosophy” sensitive to those expectations of the students and customers? This is the goal of this research. It is not intended to purport one philosophy or the other, but rather contrast the concerns of the students to the practices that institutions and trainers employ at their respective venues.

### **Review of Literature**

The review of literature on this issue is extremely problematic. There are few sources that deal with this issue head-on. Most that do are editorial sources that provide reasoning and justification for one side of the argument or the other. To begin, it is important to establish an article that addresses this issue specifically, but in a different training realm. The NFPA 1403 Standard on Live Fire Training Evolutions states emphatically “No person(s) shall play the role of a victim inside the building.” This recurs in the document in the case of acquired structures, gas-fired training center buildings, non-gas-fired training center buildings, exterior props, and exterior class B fires. NFPA 1403 has maintained this mandate for many revisions.

This issue is not addressed in the NFPA 1006 Standard for Technical Rescuer Professional Qualifications. It is also not addressed in the NFPA 1670 Standard for Operations and Training for Technical Rescue Incidents. These three facts lead one to the inevitable conclusion that the discretion to use persons or manikins is largely left to the Authority Having Jurisdiction (AHJ).

For the purposes of the rescuers and the possibility that persons are utilized as victims, it is advisable to adhere to the other safety components stated in NFPA 1006, NFPA 1670, and several others. OSHA 1926.502 fall protection systems criteria and practices advises on best practice for work at height. OSHA 1910.146 defines confined spaces and the safe ways to work in and around them. OSHA 1910.147 goes on to outline and define practices for lock-out and tag-out of the hazards of permit required confined spaces. These standards and other standards can guide instructors to employ best practices when training whether using either of the two training philosophies.



respondents for that particular question. The survey was also broken into industry and municipal fire categories.

## Results

### 1. Has any of your training (current / previous) used live patients in rescue scenarios?

	Yes	No
Firefighters	85%	15%
Industrial Rescue	62%	38%
Total	78%	22%

Table 1

### 2. Which do you find more beneficial in training?

	Manikins	Persons	Both	No Response
Firefighters	23%	68%	4%	6%
Industrial Res.	48%	42%	9%	1%
Total	31%	60%	7%	2%

Table 2

### 4. Have you ever participated in a rescue scenario as a patient?

	Yes	No
Firefighters	64%	36%
Industrial Rescue	46%	54%
Total	59%	41%

Table 4

### 5. Would you rate this experience as:

	Positive	Negative	Neutral	No Response
Firefighters	67%	1%	23%	9%
Industrial Res.	75%	0%	17%	8%
Total	69%	1%	22%	8%

Table 5

### 6. How would you describe a trainer's decision to use live patients as victims in scenarios:

	Progressive	Irresponsible	Unsafe	Beneficial	Other
Firefighters	31%	1%	5%	57%	7%
Industry	18%	2%	0%	74%	6%
Total	27%	1%	4%	63%	7%

Table 6

### 7. Have you ever known a patient to be participating in a rescue scenario to become:

	Ill	Panicked	Injured	None/No Harm
Firefighters	0%	6%	1%	93%
Industrial Res.	2%	8%	4%	86%
Total	1%	7%	1%	91%

Table 7

## Conclusions

When an instructor asks a question and creates a survey instrument, one cannot help but harbor biases and preconceived notions. This sample is very representative of the State of Mississippi and the customers of the Mississippi State Fire Academy. Many zealous instructors might be surprised that only 60% of students preferred the use of persons and patients during rescue training. In fact nearly one-third of the students prefer to utilize manikins exclusively.

Considering the same respondents, in stark contrast, 90% indicated that using live victims was thought to be either *progressive* or *beneficial*. This may constitute one of the strongest figures from the study. While not everyone believes in or prefers philosophies that use live patients, the overwhelming majority esteems it to be beneficial in the training environment.

Another statistic that is not readily apparent from the tables is that of the respondents that had participated as a patient, 86% indicated that participating was a positive experience. This figure was obtained by cross-referencing that data used to compile tables 4 and 5. A question for further research, such as in this case, is determining the nature and extent of correlation between responses to one question and another.

There is clearly a difference in the responses of firefighters and those that are members in an industrial fire / rescue brigade. The reason behind these differences is speculative, but can likely be linked to the nature of daily duties performed. The firefighters prefer the riskier option of using live patients in rescue training. Firefighters face risks daily and often find reward in such activities. Industry respondents have other responsibilities and are only called to perform above their regular duties when plant emergencies occur. These respondents aired on the more conservative philosophy of using manikins to train. Industries are under ongoing scrutiny to follow safety guidelines and maintain OSHA standards among others. This keeps safety close in mind with the industrial customer.

The overarching take-home point from this study seems to be that there is not a definitive preference among the respondent students. The industry and firefighter groups are not entirely polarized in either direction. This reinforces the constant recurring factor

in technical rescue training: that there is not only one-way to accomplish an objective. In order for this type of experiential education to be effective, it must be tailored to the students in the audience. When students are personally concerned with being a patient in a simulated activity, an instructor can assume the role. This should not be allowed to adversely impact the instructor to student ratio where safety could become an issue.

Student respondents do acknowledge the benefits of training with live-patients. Modern technical rescue training is being rocked by a wave of paradigm shift. Rather than top-operated / top-initiated rescues of old, more focus is being given to the industrial worker utilizing rope access and single-rope systems. Career firefighters are late in this shift. More training is utilizing ascending, line transfers, and access techniques. Modern training providers must dig deeper than placing a manikin at the bottom of a vertical face and proclaiming “got get it.” In order to use either of the types of patients, instructors must get more creative with their application and positioning.

A student’s experience in a rescue class should be challenging and rewarding. The research obtained from this study leads one to believe that instructors should maintain a high degree of flexibility, and offer a customized approach. Safety is the utmost priority, but the comfort of the customer is also an important –especially in the customer’s mind. Keeping in mind the possibility of student anxiety, instructors can inject themselves into the scenario as patients when this approach is needed. Some students are simply unprepared or unsafe for a live-patient undertaking. This is a fact the instructor should be assessing carefully. In summation, instructors should not be limited by any one approach, but should instead be versatile and flexible. Flexibility lends itself to a safe and dynamic training experience.