

## Skills Acquisition in EMS By *Bryan Bledsoe*

The study of skills acquisition in EMS and medicine is interesting. How does a novice EMS provider become proficient in common EMS skills? While there are several theories, one of the most interesting is referred to as the Dreyfus model. This was developed by two brothers while professors at the University of California at Berkeley. It is one of the more popular models of how people acquire technical manual skills. In their model, Dreyfus uses four binary qualities:

- Recollection
- Recognition
- Decision, and
- Awareness

Using these qualities, skill acquisition is typically divided into five stages. These include:

- *Stage 1 (Novice)*. The novice provider has little or no prior experience in the skill they are learning. Generally speaking, they do not want to learn the skill but want to simply accomplish a goal. Unfortunately, they have no discretionary judgment in regards to the skill and may adhere rigidly to the rules and steps.
- *Stage 2 (Advanced Beginner)*. The advanced beginners will begin to try accomplishing the task on their own. However, they have difficulty troubleshooting problems. They begin to see the role of the procedure outside of the procedure itself. They still use guidelines but have a better understanding of these.
- *Stage 3 (Competence)*. At the confidence level the provider begins to develop their own conceptual models and are able to troubleshoot problems on their own. They will seek out expert advice as needed. At this point they are starting to see the big picture as to why the skill is being performed.
- *Stage 4 (Proficiency)*. At the proficiency stage the provider will change the procedure to meet the current situation. They will also self-correct based on their prior experience. They do still learn from experienced providers and weigh the newly learned material against their experience. They tend to be frustrated by information that is oversimplified.

- *Stage 5 (Expertise)*. The expert no longer relies on specific guidelines or rules. They are primarily functioning from intuition. When novel situations arise they use analytical approaches to accomplish the task at hand. When forced to follow rules or guidelines, their performances actually sometimes worsened.

To put this in the context of EMS, let's look at the skill of endotracheal intubation.

- *Novice*. The novice student will carefully observe the guidelines and steps in skill performance. They will try and memorize these with the ultimate goal of getting the endotracheal tube into the trachea. However, this will be very clumsy. Most laryngoscopes are held in the left hand. Most of the population is right-handed. Thus, during early skill development you will see novice students routinely pick up the laryngoscope with the right hand and then transfer it to their left hand. As they go through the procedure they will lose track of standard precautions such as protecting the teeth and similar concerns. They simply want to complete the task and move on to the next task. They often have little insight as to why the skill is being performed and they are only doing it because they were ordered to do so or because the protocols require it.
- *Advanced beginner*. The advanced beginner will have mastered the steps in placing the endotracheal tube. However, when problems arise, they have difficulty troubleshooting the problem. For example, if they cannot visualize the cords they may use brute force to do so. Also, when there is a malfunction in relation to ventilation, it is difficult for them to determine the cause. However, at this stage, they begin to see the endpoint and reason for skills performance.
- *Competence*. Once the confidence level is reached, the student begins to adapt the skill to their personal experiences. They are generally able to troubleshoot and correct problems. However, they will often ask for advice—particularly from experts. They understand that their role is not to simply insert a plastic tube into the trachea but to provide mechanical ventilation for a patient unable to do so on their own.
- *Proficiency*. At this stage, the provider is using the skill because of perceived patient need. They are not using it because the protocol mandates it or similar reasons. They have modified their skill based on personal experience and successful performance in the past. They do self-correct their errors so they don't make them again in the future. They still learn from the experience of

- others. However, if somebody tries to instruct them in a very elemental part of the skill, they become frustrated quickly lose interest.
- *Expert.* The expert provider performs a skill only when he or she perceives the benefits to outweigh the risks and it is in the best interest of the patient. They do not follow dogma or rote guidelines. They rely on their own experience and intuition. When problems arise, such as a nonfunctional ET tube cuff, they use an analytical approach to try to determine the problem and correct it. If they are made to follow the original rules and procedures used to teach a procedure, they actually tend to have problems in the overall success rate of the procedure. Interestingly, at this level the skill almost becomes reflexive. At this point the provider, despite being right-handed, will pick up the laryngoscope with their left hand without thinking about it.

While there are other models of technical skill acquisition, the Dreyfus model is a good guideline for EMS instructors when teaching some of the more complicated medical skills. Over time you learn to recognize the stage at which your student is in and will see improvement across the stages as a master the skill. Typically, students should be graduated at the proficiency level with expertise attained later.

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