TO ERR IS VERY HUMAN

by Kenneth Capek RRT, CHT, MPA

A few years ago I went into the hyperbaric center to cover for a technologist at lunch. I was not familiar with the patient but this was a simple, routine hyperbaric treatment. As is usual safety protocol, I mentally went through a checklist of things that the patient could not bring into the chamber for safety reasons. I was observing and running down the list, no papers, rings, watch, etc., when one of our physicians came in and asked me some questions about something unrelated to this patient. After he left I returned to what I was doing. I believed I had completed the safety checklist activity. This is a "systems" safety mechanism created to ensure that nothing gets into the chamber that shouldn't be there. The fact is, I did not complete the checklist but something in the back of my head or in my gut said something was wrong. In many cases I might have ignored this subtle warning but for some reason I did not and checked again. When I got to the part about asking the patient if she had anything in her pockets, she checked and responded, "Oh yes, my BIC cigarette lighter". I would like to think maybe I had a subconscious clue because I smelled smoke on her, but I didn't. The new additional "systems" remedy after that day was to remove all pockets from our supply of medium blue, HBO labeled 100% cotton scrubs. We had a good checklist system in place but if I didn't stop and start over this could have been my last patient. The bigger question: Why did I think I completed the checklist and therefore deceive myself? Human error is not always due to neglect, lack of training or bad luck. It may simply be due to mental miscues.

We humans go through the day for the most part on "auto-pilot". We perform the same routines hundreds or thousands of times without really thinking about them. If my wife calls me at work and tells me to stop on the way home and get milk I had better write it on a post-it and place it on my car rearview mirror. If not, I will end up in my driveway when it finally registers that I forgot something. In addition, I would not be able to tell you anything about the trip home unless something significant or emotional happens like seeing an accident or someone cuts me off.

We go through our lives with our minds operating on a type of cruise control and it is part of our being human. The psychological explanation for this is that we create "situational models" in our minds. Laurence Gonzales writes about how this process works in his excellent article called "Why smart people do dumb things" (Adventure magazine August 2007). He explains that we form models of the world, as we believe it to be and use these pre-constructed models to function in that world, rather than using the actual world we are presently experiencing. This clearly has a potential for danger and partially explains why smart people do in fact make dumb mistakes sometimes. He writes, " We code information in an abbreviated form for quick reference" which enables us to function more efficiently. Once these models have been developed they require no thought to put them to use." These models are sometimes constructed haphazardly, without good information and are based purely on our past experiences. What if that past experience we are referencing doesn't quite apply to the present situation. There is a well-studied behavioral phenomenon, which says we tend to generalize about things in the future based upon about things that worked in the past. In addition, we tend not to notice things that are not familiar to our model. Like using old assumptions that don't apply, this practice can result in unexpected outcomes. I hike over a mountain on a hot summer day and come to a beautiful, clear, blue river. I think (my model) I will jump in and have a short refreshing swim before I move on. I act on this thought only to find the current is strong, the riverbank is high and there are rapids 200 ft. down stream. Opps!

Another function of our mind is to ignore things that are too common and no longer have significance. Can you tell me what that picture is hanging in the hallway you pass every day. Gonzales explains, "We really don't perceive the world most of the time. We take in perceptions through our senses and then pull up what seems like the most relevant mental model. We see, hear, smell and feel by analogy. This system allows us to move smoothly through the world without having to stop all the time to reexamine something we've already examined, but this efficiency comes at the cost of careful analysis". This brings us back to the issue of safety. We can build elaborate systems to reduce risk but we still have the human element. Human error will always exist. We still must endeavor to minimize risk in

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every way possible but must not be lulled into a sense of security that we become complacent. How often do we hear people ask how something could have happened? Our world is not 100% safe yet our technology and systems mislead us into thinking that it is and everything is taken care of.

What can we do?

We can be safer and reduce the risks in our everyday lives if we acknowledge and understand how our minds and their models work. The most important thing we can do is getting off autopilot when it comes to operating in areas or risk. Protocols and checklists do if fact work but we must also slow down the process and examine what you are doing. Does the phrase "take a time out" sound familiar? The Joint Commission looks for this procedure in every operating room to reduce the risk of operating on the wrong patient to cutting off the wrong leg. It is simply a break in the fast routine of everyday operations to reexamine and think. Allow yourself time for a second thought, because first thoughts are sometimes not thoughts at all. Have you heard of the acronym STOP (Stop, Think, Observe, Plan)? In diving we have a similar recipe when faced with problems and nearing a panic situation: STA (Stop, Think, Act). First Stop, get off autopilot, this may be a situation you never before experienced so don't act yet. Think, see all your options and pick the best. Act, implement your plan. I would add to this, take a slow Deep Breath, which actually helps to break the panic cycle. Your world will be safer when you are not operating on autopilot and just think how wonderful the world is when you are actually observing it. Slow down the pace. Just think how many accidents occur when you are rushed and autopilot is in high gear. When you are interrupted during a routine safety check, start over! Yes it takes time but then ask yourself how important is it and what are the consequences if something is missed. In the hyperbaric environment that cost may be extremely high. Before you close the chamber door, take a time out.

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She is a completely normal young female in appearance except for the findings when examining her chest and chest x-ray. Auscultation reveals clear breath sounds throughout with the presence of plural rub bilaterally and the Heimlich valve with an air leak located on her right chest. The chest x-ray report notes the presence of an FBO located over the medial aspect of the left hemidiaphragm. Normal mediastinum is noted in the radiology reports. Also seen has been the presence of multiple small pulmonary cysts, bilaterally, renal and liver lesions, and multiple sclerotic bone lesions, all consistent with TS and LAM. A stable right pneumothorax with thoracotomy tube is in proper placement for treatment of persistent pneumothorax on the right side.

Treatment options for this patient are limited. "Without lung transplant, there is a 50-80% 5-year survival rate". Since LAM primarily occurs in child bearing aged women it is thought that hormonal stimulus affects the disease process. Treatments with; progesterone, oophorectomy, tamoxifen, gonadotropin-releasing hormone (GnRH) agonists, and androgen therapy have been used to diminish estrogens effects with varying results and unwanted side effects. Treatment with doxycyline may have little side effects and sirolimus is being tested as a treatment for LAM.

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I was not being deliberately foolhardy--I respect my coworkers greatly and made preparations to use bi-PAP temporarily and re-intubate quickly if necessary. To justify my decision to myself and to others, I had to integrate many pieces of unquantifiable data and weigh their influence against that of an accepted numeric index of 'weanability'. I was aware that rapid shallow breathing is inherent to ambulatory patients with restrictive (low compliance) diseases of the chest and to those with reflexes triggered by lung parenchymal disorders. Moreover, the RSBI rises predictably when ventilatory requirements increase--even in healthy exercising normal individuals. The patient had good cardiac reserve, appeared alert, and although working noticeably to breathe, did not appear in marked distress, despite his frighteningly high RSBI. His minute ventilation did not fall when on low level pressure support, and there was noticeable variation in the depth and frequency of breathing. Perhaps most convincingly, he had only a modest secretion load and seemed to exhibit some strength reserve when his cough reflex was stimulated by the suction catheter. Finally, I explained as best I could what adverse events might happen when we removed the tube, and yet the patient remained eager to try. The "gleam in the eye" and breadth of the smile were hard to score on the protocol sheet.

Widespread enthusiasm for protocolized ventilator care reflects its generally positive impact. If thoughtfully designed and implemented, protocols expedite quality care. even Even when unsuccessful identify those patients whose management details need closer attention. Many of the toughest problems, however, seem to yield only to experience and a reasoned analytical approach that integrates clues from a variety of sources. Some of these signals defy facile coding into rules and care directives. In these all-too-frequent instances, the rules must and should be broken.

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