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Helping Children Cope with Medical Tests and Interventions

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Abstract

Medical procedures and tests become a challenge when anxiety and pain make it difficult for the patient to cooperate or remain still when needed. Fortunately a short intervention with hypnoidal language at the onset of a procedure induces a positive and sustained change in the way pain and anxiety are processed. While anesthesia may appear to be a simple solution to eliminate pain, the adverse effects of pre-anesthesia anxiety on postoperative behavior and recovery are often not fully appreciated. This paper discusses options for self-hypnotic relaxation that are applicable to interactions with children. The high suggestibility of children makes it relatively easy to engage them in make-believe scenarios. Avoidance of negative suggestions is key in avoiding nocebo effects that may be difficult to overcome later. Once a child is immersed in his or her preferred scenario or hobby/activity of choice, environmental and procedural stimuli can be easily integrated in the imagery. Ego-strengthening metaphors that tie in features of strength, confidence, or resilience are particularly empowering. Even when children are fully under general anesthesia they may still have recall of what is said in the room and therefore caution in word choice should be maintained.

Keywords

Sedation; Communication; self-hypnotic relaxation; Anesthesia; Pediatric Interventions

INTRODUCTION

Medical procedures and tests become a challenge when anxiety and pain make it difficult for the patient to cooperate or remain still when needed. This is even truer for children. Moving right away toward general anesthesia or deep sedation seems an easy path towards having a child lie still and not having to deal with the child's emotions while the case is ongoing. The

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adverse effects of anticipatory anxiety involved with induction of anesthesia, however, are not always fully appreciated (Z. N. Kain et al., 1997). Nonpharmacologic alternatives become attractive as they can reduce or even eliminate the need for pharmacologic sedation and can aid in improving the peri-anesthesia experience. Whichever route is chosen, nursing is at the forefront of managing the children's distress. It may be while placing IV's or assisting their patients through the procedures, or in preparation for induction of general anesthesia.

When treating children there are more parties to take into account. One not only has to take care of the child, but also of the accompanying parent(s) or caregiver(s) whose emotional engagement and parenting style may interfere with the child's ability to use his or her innate coping mechanisms. This article addresses the challenges and implications of the setting and how they can be overcome through targeted use of comforting suggestions and guidance in self-hypnotic relaxation.

THE SETTING

Distress in the Waiting and Prep Rooms

Presenting to the radiology department is commonly associated with high stress levels and perceived impact on daily life (Flory & Lang, 2011). Uncertainty about diagnosis can elicit even greater stresses than those associated with anticipation of risky invasive therapeutic procedures (Flory & Lang, 2011). Preoperative fear and anxiety are common before surgery or medical procedures (Karanci & Dirik, 2003; Rosen, Svensson, & Nilsson, 2008) and may have far reaching consequences. Besides direct effects on the immune system, anxiety lowers pain thresholds and facilitates overestimation of pain intensity which results in increased postoperative pain (Colloca & Benedetti, 2007). This weakens the immune function even more and may have consequences such as delayed wound healing (Broadbent & Koschwanez, 2012) and development and progression of cancer (Webster Marketon & Glaser, 2008). To reduce preoperative anxiety and stress, anxiolytics may be prescribed although preoperative use of this medication is an independent risk factor for major morbidity and mortality after surgery (Ward et al., 2015).

Time spent waiting in the preparation room before being transferred to the operating theatre is experienced as one of the most frightening events in the perioperative period and should be kept as short as possible (McCleane & Cooper, 1990). The sight of technical equipment was the physical environmental factor that most increased anxiety in the intraoperative period. Seeing surgical instruments also contributed but to a lesser degree (Haugen et al., 2009).

The anesthesia provider-patient relationship (rapport) during the pre-anesthetic visit has a beneficial anxiolytic effect and the pre-operative discussion and reassurances measurably reduces postoperative pain (Egbert & Jackson, 2013). Therefore the question may be raised why pharmacological sedation is used, when an otherwise adequate anesthetic (in form of nerve blocks or intrathecal anesthesia) is used and/or simple conversation with the anesthesia provider or nurse might have a therapeutic effect (Schulz-Stubner, 2015).

Preoperative Anxiety in Children Undergoing General Anesthesia

Distress related to the induction of general anesthesia in children is well-documented in the literature (Z. N. Kain et al., 1997; Varughese, Nick, Gunter, Wang, & Kurth, 2008; Yip, Middleton, Cyna, & Carlyle, 2009). Furthermore, high preoperative anxiety surrounding this event is a predictor of postoperative pain, prolonged recovery, and postoperative maladaptive behavior such as nightmares, separation anxiety, eating problems, and increased fear of doctors (Johnston, 1986; Z. Kain, Mayes, O'Connor, & Cicchetti, 1996; Z. Kain, Ming Wang, Mayes, Caramico, & Hofstadter, 1999; Vernon, Schulman, & Foley, 1996). Post surgical intervention, even post-traumatic stress disorder may develop. (Aaron, Fadale, Harrington, & Born; Favaro et al.)

A Cochrane Collaboration Review analyzed 17 trials of non-pharmacological interventions for assisting the induction of anesthesia in children in efforts to minimize induction distress and subsequent effects. (Yip et al., 2009). The trials included 1796 children, their parents or both.

Evaluation of parental presence at anesthesia induction in eight trials examined failed to show significant differences in anxiety or co-operation of the children during induction except for one trial which showed that parental presence was significantly less effective than the use of midazolam in reducing children's anxiety.

The review identified six trials with interventions for children. Use of a computer program prior to induction yielded better co-operation than having parents present (one trial; (Campell, Hosey, & McHugh, 2005)). One trial examined the impact of using video games with significant positive effect on anxiety compared to no intervention or premedication (Patel et al., 2006). In another, clown doctors were found to reduce children's anxiety more successfully than no intervention (Vagnoli, Caprilli, & Messeri, 2010). Hypnosis was associated with a non-significant trend toward reduced anxiety during induction compared with midazolam (Calipel, Hosey, & McHugh). A low sensory environment improved children's co-operation at induction (Z. N. Kain, Wang, Mayes, Krivutza, & Teague, 2001). Music therapy was unsuccessful in reducing children's anxiety (Z. N. Kain et al., 2004).

Interventions for parents had mixed outcomes. When parents received acupuncture, in one study, to decrease their own anxiety levels, their children were less anxious during induction as compared to children whose parents had received sham-acupuncture (Wang, Maranets, Weinberg, Caldwell-Andrews, & Kain, 2004). When a video was viewed preoperatively neither child nor parent had showed a benefit (McEwen, Moorthy, Quantock, Rose, & Kavanagh, 2007; Zuwala & Barber, 2001).

The conclusion drawn from the Cochrane review was that parental presence at the time of induction of anesthesia does not influence the amount of anxiety experienced by the child, however the other nonpharmacologic interventions were helpful in reducing anxiety but need further study. The limitations of the review were the lack of a consistent tool to measure anxiety and outcomes, a clear distinction was not drawn between the use of pre-op sedation versus a non-pharmacologic intervention to reduce anxiety and none of the studies assessed outcomes after the child had returned home following the procedure.

There is strong evidence supporting the use of pre-op sedation to relieve induction anxiety in younger children (McEwen et al., 2007; Zuwala & Barber, 2001). However, midazolam, the usual drug of choice at this institution, takes 20–30 minutes for peak effect which sometimes delays the procedure. It has also been associated with emergence delirium in younger children and has not been consistently associated with improved postoperative behavior. (McEwen et al., 2007; Zuwala & Barber, 2001).

The mask anesthesia induction experience, with the pungent vapor, force often applied to restrain the child, and ineffective fight or involuntary submission that is required, can be very stressful to the child.

The Power of Suggestions

Simply entering a hospital or medical facility places a patient in a trance-like, focused state, making him or her acutely sensitive to any suggestion, good or bad. Unfortunately, in the ambiguous case of what a health care professional or environmental stimulus may mean, human nature is geared to choose the more negative interpretation (Murphy & Zajonc, 1993). Throughout evolution, individuals who assumed the worst and took standard precautions likely fared better in their survival in the wild than those more nonchalant (Ewin & Eimer, 2006). Unfortunately the same is not true in the medical setting where negative expectations can become reality ranging from the experiencing of pain to even death (Bayer, Coverdale, Chiang, & Bangs, 1998; Voelker, 1996).

There is the risk of misinterpretation of statements. For example, the possible remark of an anesthesia provider, “I am going to give you an IV”, can be understood as ivy, or poison ivy and confuse or frighten the child. “I am going to put this mask over your face” can be misinterpreted to mean, “He is going to suffocate me!!” Adults may actually be more prone to misunderstanding than younger children who do tend to take things more literally rather than seeking second meanings. Children also have a limited vocabulary which they use for understanding and positioning a statement. Even an introduction such as, “I am the sleep doctor”, may confuse the child. Will he cure sleep? Does he sleep a lot? The health care professional thus has the enormous power to shape a patient’s perception and even outcomes merely by intentionally or unintentionally using certain words.

The effect of pills, real and placebo, is another testament to the power of the mind in producing reality (Barsky, Saintfort, Rogers, & Borus, 2002; Cocco, 2009). The meaning of “placebo effects” is widely known, whereas its counterpart “nocebo effects” is less acknowledged. One of the classical studies nicely demonstrating a nocebo effect involved investigating whether exposure to radio frequency fields from mobile phones may cause head pain or discomfort (Ofstedal, Straume, Johnsson, & Stovner, 2007). All study subjects were informed about the possibility that head pain could be evoked but only half were actually exposed to radio frequency. Interestingly all experienced an increase in pain/discomfort during most of the trials (in 68% of all), regardless whether radio frequency was applied or not.

Several other studies had similar results with widely varying study designs but the same basic idea: applying a non-painful stimulus or a stimulus below the pain threshold was rated

as painful if the volunteers were expecting the stimulus to be (potentially) painful (Tracey, 2010). These nocebo effects involve the endogenous opioid system and several nonopioid-based mechanisms involving a frontal-limbic-brainstem network. This neural basis for nocebo effects was shown in an increasing number of studies using positron emission tomography, and electroencephalography (Atlas and Wager, 2012).

Understanding and being aware of continuous negative suggestions made by healthcare providers is an important step in improving communication with patients. For example, many healthcare providers routinely give negatively-loaded statements warning patients of upcoming events, like “little sting here”, “it will hurt a bit”, “sharp scratch”.

A study in interventional radiology showed convincingly that such statements were associated with subsequently greater reported pain and greater reported anxiety (Lang et al., 2005). Also sympathizing after the stimulus, with statements like “I know this was bad ...”, does not help. It did not affect subsequent pain ratings but increased significantly subsequent anxiety ratings. In a prospective randomized study, wording during insertion of an IV cannula was compared in its effects (Dutt-Gupta, Bown, & Cyna, 2007). One group was told: “I am going to apply the tourniquet and insert the needle in a few moments. It’s a sharp scratch and it may sting a little.” The second group was told: “I am going to apply the tourniquet on the arm. As I do this many people find the arm becomes heavy, numb and tingly. This allows the drip to be placed more comfortably.” Only in the first group were patients vocalizing and withdrawing arms during insertion of the IV cannula.

In a similar study, the authors randomized patients to 1 of 2 different choices of words during the administration of local anesthetic before epidural analgesia or spinal anesthesia in healthy patients. One group was told, “You are going to feel a big sting and burn in your back now, like a big bee sting; this is the worst part of the procedure.” The second group was told: “We are going to inject the local anesthetic that will numb the area where we are going to do the epidural/spinal anesthesia and you will be comfortable during the procedure.” The pain on the verbal analog scale (VAS) during injection of local anesthetic was rated significantly higher in the first group (Varelmann, Pancaro, Cappiello, & Camann, 2010).

If there is this amount of evidence about negative suggestions and nocebo effects, why is it still done routinely by health care providers? Probably the two most important reasons are: healthcare providers either truly believe such suggestions are helpful to patients and/or health care providers are simply repeating the vocabulary and approach they have been taught and with which they have become familiar.

How can we improve this? The first important step is to be aware of the use of negative suggestion. The second step is to avoid it. It is better not to say anything or to say something neutral, thus giving patients the right to their own experience. It is better to avoid mentioning pain or any of its euphemisms and instead focus on predicting e.g. a possible sensation of touch, coolness or warmth.

While it may seem enough to simply to change vocabulary and say things differently, such a change of behavior often goes to the core of understanding of one’s caring and years of habit. When we train medical teams in advanced communication skills and use of hypnoidal

language (Comfort Talk®) we take great care in helping the teams themselves finding wording that is most appropriate for their patients and also in agreement their own personalities. Only then does the new verbiage become second nature, regardless of how stressful the exterior environment may be. However, there are general tenets on how to use suggestions effectively. In combination with adaptation of nonverbal communication to the patients preferences, even slight changes in vocabulary can significantly improve patients' ability to cooperate and report a satisfied experience (Lang et al., 2013; Norbash et al., 2016). For more pointers you can download a free chapter from *Patient Sedation Without Medication* at <http://comforttalk.com/books>.

COMFORTING TECHNIQUES FOR USE WITH CHILDREN

Small Changes in Language with Big Effects

Much of what applies to improving communication with adults is also pertinent to interactions with children. A description of such techniques for use with adults is found in a prior issue of this journal (Lang, 2012). It is most critical to adapt to the patient's body position by bending towards rather than towering over patients – particularly when dealing with smaller children.

When it comes to word choices a good start is the avoidance of “try” – unless one wants to achieve the opposite. “Try” implies inability to do in the subconscious, and inviting a patient to “try to close the eyes” will result in the opposite --the eyes will stay wide open. If you want them closed, saying “try to keep them open” is more effective. As the reader you can try for yourself now to keep your eyes open for a few minutes and notice what happens.

If one examines further the example from the above mentioned trial by Dutt-Gupta et al., one can tease out the following techniques: “I am going to apply the tourniquet on the arm. As I do this many people find the arm becomes heavy, numb and tingly. This allows the drip to be placed more comfortably.” This communicates what the healthcare provider is going to do (“I am going to apply the tourniquet on the arm.”), focuses on non-painful sensations (“As I do this many people find the arm becomes heavy, numb and tingly.”) and why it is done (“This allows the drip to be placed more comfortably.”).

It is also interesting to note the difference between the choice of words in the study of Varelmann et al: “You will be comfortable during the procedure”, which is a prediction, and the choice of words in the study of Dutt-Gupta: “...many people find the arm becomes heavy, numb and tingly. “, which allows more choice in acceptance. From a communication theory point of view the latter is to be preferred. The former gives a promise “You will be ..”, that the healthcare provider may not always be able to make come true. The latter “Many people find..” will be interpreted in the patient's brain in the same positive way but without making a promise with all the accompanying possible problems of promises. Such language is also a good tool for providing answers to perioperative questions from patients, like “will it hurt?”, “will I be nauseated and vomiting”, etc. An option could be, “Different people experience it differently. And some are surprised how well they did.” Adding that one will do everything to make the patient comfortable is also helpful and reassuring.

If the patient is hurting one might say; “I don’t know when it will stop hurting – in one minute, two minutes, four minutes, or ... NOW” or “I think you are going to feel better – may be in a few moments, I don’t know when, it may be NOW.” Putting extra emphasis on the NOW has already a hypnotic positive suggestive effect while leaving options open by framing it within “I think ...” or “I don’t know ...” or using indirect language constructs such as “may, perhaps, possibly.”

Hypnotic Interventions

Child Life or similar interventions are mainly based on distractive techniques such as blowing bubbles etc. In contradistinction “hypnotic” or “make believe” interventions are geared toward having the child immersed in a different experience. In that context the high hypnotizability/suggestibility of children comes as great help (Kohen & Olness, 2011). In hypnotic interventions the aim is to get a focused attention and absorption into imagination which reduces awareness of external stimuli and reality. The state is similar to day dreaming, or pretend play in which the child is fully immersed in its imaginary scenario. In order to achieve this, each age group will require a different age appropriate approach. As soon as the child has developed a longer attention span and increased understanding of language they can learn self-hypnosis that they can apply when undergoing a procedure in the same way adults do.

The reason that very fast hypnotic interventions work well in interventional radiology and during surgeries is a profound and sustained change in pain and anxiety processing (Lang et al., 2000; Lang, Tan, Amihai, & Jensen, 2014). Under standard care conditions pain and anxiety increase linearly over the duration of a procedure, relatively independent of the invasiveness of the procedure and amounts of drugs given (Lang, Chen, Fick, & Berbaum, 1998). Reading of a short Comfort Talk script at the onset, however, reverses this process. As additional benefits patients are hemodynamically more stable (Lang et al., 2000). Distraction alone does not achieve this change (Lang et al., 2008). Similarly, reading short script parts (90 sec – 3min depending on severity of presenting anxiety) or conversational use of Comfort Talk® by radiology personnel has been shown to enable patients to overcome claustrophobia and endure lengthy MRI examinations with less disruptive motion (Lang, Ward, & Laser, 2010; Norbash et al., 2016). Techniques chosen will depend on the age and maturity level of the patient. For more extensive reference and techniques for adults that can be also used with teenagers see (Lang & Laser, 2009) and for child-specific interventions a treasure trove is found in (Kohen & Olness, 2011).

Children’s Suggestibility

From birth children learn that the parent/adult brings comfort and nurturing. They start with accepting the surroundings, their perception as well as fantasies as a continuum. This continuum dissipates with growing up, experiencing the differences and learning (Huynh, Vandvik, & Diseth, 2008). Also children are able to move between intense feeling states easily. They are open to experiences and exploring. Children more easily relinquish control and react submissively, following instructions without misconceptions interfering. This makes children excellent candidates for accepting suggestions until they develop a resistance or fear from experiencing the harsher side of life.

The manner of communicating with children should reflect the developmental stage of the child. UNICEF has defined three age groups: the early years (0–6), middle years (7–11) and early adolescent years (12–14) (Kolucki & Lemish). Each group has special communication characteristics. In the early years, children react to simple language, soothing tones, rhythm, touch, fantasy trips and encouraging speech in repetition. They have a short attention span. Normally a child can be hypnotized from the age of five depending on the child's developmental age. The middle year group has developed a better distinction between reality and fantasy. These children still love a story game, and to interact on their own interests such as school, sports or friends. They understand humor. The early adolescent group is capable of adult thinking and relates to peer-groups and role models (pop groups). These children have divergent view points and a growing desire for independence.

METHODS

When working with children it is ideal to associate a favorite scenario or hobby with an ego-strengthening element, e.g. a feeling of confidence, pride, achievement, and resilience as will be shown in examples below. You can also include metaphors in the action that associate the child either with desirable attributes or actions (such as holding still or being courageous). Avoid the suggestion to go to a "happy place" or "safe place" and only project into the future, never into the past. You don't know what might have been lurking around the corner at a "happy place," and what mom or adults consider "a safe place" for the child may not be a place the child enjoys. It is more appropriate suggest a place "where you like where you are and how you feel." The risk with reference to past experiences is that a child (or adult) may suddenly have a flashback to a traumatic event and that can become difficult to handle for a non-mental-health specialist. To get started some of the following scenarios below can be used in adaptation from (Kohen & Olness, 2011).

Favorite Place

Have the child pick a favorite place and suggest he can go there now, either keeping his eyes open or closed. You can also suggest that she will probably be more comfortable with them closed. Younger children, though, may not want to close their eye, which is fine. They are very good at open-eye pretend. It is also helpful to suggest that they use all their senses, such as "see yourself, hear yourself, get the feel and touch, smell, taste".

Multiple Animals

The child thinks of a favorite animal and feels the fur and sees its color. He can pat the animal, change its color, and add stripes, or even more animals since it is in the child's imagination. This lets the child be in charge. The child can let you know all about the animal they want.

Flower Garden

Child imagines self in flower garden. Can have favorite toy or stuffed animal with them. Again, use imagery to see, smell, touch, pick flowers, make a bouquet. Flowers can be given to someone special. This can also be used by including metaphors about being kind, gentle, etc. You can also use ego-strengthening descriptors along the lines of how delicate and

fragile appearing flowers are, but that they are able to withstand rain, snow, wind, and hardship, and always come up again.

TV, Movie, or Computer Fantasy

If a child enjoys watching TV or movies they can watch their favorite. They can choose the setting, program, episode and be entirely in charge. They can also be in the action themselves. You can give the child the clicker so she is in charge. If you will be giving suggestions, blend them into the program. For example, a child who will not swallow medication may find that the hero (or heroine) of the story has a similar problem but takes the medication because it helps her feel better and have energy. Or if the child has concerns with tight space, the hero has this difficulty too at times but because of his strength and drive always accomplishes the task and actually feels very proud about doing it.

Sports Activity

The child can imagine herself playing any sport she wants. She can be part of the team, even be its captain and give instructions to others. Notice how strong she feels and what control she has. Now her team is winning. If there is lots of noise one can integrate the noise in the imagery and explain that the fans are so excited about how well the game is going.

Case Examples

Case “Johnny” 3 years old: Johnny (J) has to undergo anesthesia for a procedure. J is taken to the procedure suite and put on the OR table. J says, “I do not want to be here.” The anesthesia provider (AN) asks, “Where DO you want to be?” J: “I want to go to the candy factory!” AN, “OK, let’s go there. Give Mom and me your hand and we will walk there.” So J gives the mother and AN a hand and AN goes, “Pomdy pom, we are walking (moving arms up and down). If you close your eyes you can see the gate.” J closes his eyes. AN, “Can you see the gate?” J nods heftily. AN, “OK, let’s walk to the gate. Can you see the colors?” J nods again. AN, “Good. So now we are at the gate but it is closed so we need to knock. J, can you knock on the gate?” J nods and does an air knock. AN, “Knock, knock who is there?” J, “Jooooohnny.” AN, “I cannot hear you. You have to speak into the speaker. This is the speaker.” AN holds the mask in front of J and then against his face. J, “Hellooo”. AN, “I can hear you. I will give you a smell and if you blow, then it will change to a sweet smell and the gate will open. Can you tell me when you smell it and when it gets really nice?” J nods eagerly. AN, “OK we start. Can you smell it?” J nods and starts to blow. AN, “Good. See the smell gets nicer and nicer. I like it and Mummy likes it! Do you like it?” J nods, blows and blows and goes to sleep.

Case “Sophie”, 8 years old: Sophie was scheduled for a procedure. Because of repeated surgeries, she was extremely anxious about the IV insertion. Psychologic counselling was offered and special instructions were provided by the pediatric psychologists on how to treat this lovely child. Her mother accompanied her.

The anesthesia provider (AN) unaware of these instructions, but trained in hypnosis, introduced himself to the child in the waiting room and immediately asked about her hobbies. She replied, “I am doing gymnastics.” AN, “Do you want to do gymnastics now, on

the balance beam?" S: "If I could." AN, "You can! Close your eyes and think about your last meet. You are standing along the beam. When you look around, who do you see in the public?" S, "My grandparents, mom and dad." "Do you hear the noises?" S, "Yes, everybody is yelling and shouting." AN, "And now you do not hear the noises anymore. They are not helpful when you need your attention on the beam. You hear only my voice, giving you instructions for a good result. Do you have the magnesium on your hands? Show me your hand so I can see it." Sophie stretches her arm and offers her hand.

While AN puts the tourniquet for placing the IV on her arm, he says, "I am taking your arm for helping you on the beam. Now you are on. Take your equilibrium. Do you feel OK?" Sophie says, "Yes." AN, "Now you will perform the most difficult exercise you have practiced on the beam. You know that you can do that for me, but can you explain to me how it works?" Sophie starts to explain the gymnastic exercise. AN, "OK, we'll do that. When you are ready with the exercise, you bow your head, just like in the exercise. First we will start with the concentration for the exercise and then start, 5 you feel your muscles in your shoulders and arms, 4 the muscles in your back, 3 your legs balancing on the beam, 2, the very tiny muscles of your feet on the leather of the beam, 1 and start ..."

Then the anesthesia provider places the IV. The 90 seconds the exercise takes was enough to finish the job. Sophie bows her head. AN, "It was fantastic! You did a wonderful exercise. You won! If you want to see it you may open your eyes. If not it is also all right, but enjoy this wonderful feeling of winning and afterward you may relax and sleep now"

With her eyes closed, Sophie was brought to the OR and anesthesia induced through the IV line. Sophie's mother stated, "This was certainly not according to the psychological exercises we have done before, but I do not care because it is the first time that it went so smoothly."

Case "Frank", 10 years old: Frank is referred for an MRI with which he has had difficulties before. When asked where he would like to go or if he likes any sports, he doesn't want to do anything. The nurse suggests that this is OK too and that it will be just boring. Just like when driving in the back of the car or bus to a great vacation, it is just boring. He can look out the window and just see all the houses and trees go by and that the noises are just the other cars on the road.

Frank liked that suggestion and did well for the next 45 minutes. When time for the contrast injection came and the nurse asked him where he had imagined himself being, he stated that he had been playing hockey. He first didn't want to get the contrast but when the nurse explained that he had to go back and keep playing since the score is very tight, he willingly agreed to shoot the winning goal. When he had completed the exam, he proudly ran towards his mom exclaiming, "I did it! And I scored."

Anesthesia Recall and Post Traumatic Stress Disorder

If a case is performed under general anesthesia or deep sedation, this doesn't mean that conversation in the room is "free for all". Medical procedures can precipitate post traumatic stress disorder (Aaron et al.; Kleiman, Clarke, & Katz; Rossi et al.). There is debate on how

much patients may remain aware under anesthesia. The incidence of conscious recall is reported as being approximately 0.1–0.2% in adults, and has been reported as being 0.2–1.2% in children (Bischoff & Rundshagen, 2011; Davidson, 2007). In their recent review of literature pertaining to awareness under anesthesia, Bischoff and Rundshagen note that “patients may have both auditory and tactile perception, potentially accompanied by feelings of helplessness, inability to move, pain, and panic ranging to an acute fear of death. For some patients, the experience of awareness under anesthesia has no sequelae; for others, however, it can lead to the development of post-traumatic stress disorder, consisting of complex psychopathological phenomena such as anxiety, insomnia, nightmares, irritability, and depression possibly leading to suicide” (Bischoff & Rundshagen).

If an element of awareness does exist, patients may be prone to and capable of hearing positive suggestions of healing during their procedures. To our knowledge this hypothesis has not been rigorously tested. We are currently evaluating this concept in a clinical trial at Toronto Hospital for Sick Children in the Cardiac Diagnostic and Interventional Unit. In this trial we will include a recovery script for the children to be read just at the time when they will be reawakened from anesthesia. This is a time that may be frightening as the gag reflex returns, the airway needs to be removed and the anesthetic agents are wearing off. One may further speculate that tissue stimulation, such as during interventional procedures or in cardiology with prolonged pacing to very high heart rates during electrophysiology procedures, may leave at least a “physiologic” memory of stress and reframing of these sensations as early as possible may be beneficial.

Conclusions—Word choice and suggestions can have a profound impact on children. Key is avoidance of negative suggestions in language and behavior. Leaving children choices and options as to what will happen instead of direct predictions of the future will help to keep the trust and engender cooperation. The high level of suggestibility of children can be used purposefully in guiding them towards scenarios and make-pretends that may be all that is needed. Sometimes just asking where the child would rather be and connect the scenario with desirable behaviors/attributes is all that is needed, can be done while doing other preparation work with the patient, and may be done in a few seconds.

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Highlights

- Preoperative anxiety of children is a predictor of poor recovery and postoperative behavior
- Small changes in wording can make a big difference in outcomes
- Negative suggestions mentioning pain and undesirable emotions increase pain and anxiety
- Children respond well to comforting language and hypnotic suggestions of make-believe scenarios