

COMPUTER GRAPHICS IN CHILD ABUSE & NEGLECT

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Telling others about an abused child is an essential step in obtaining justice, attempting prevention, and teaching awareness. Consider the following teaching assignment:

You must teach a group of 12 students ranging in age from young adults to retired seniors about complex medical issues. The students may have no background in science and may not even have a high school education. They were ordered to be present for your teaching. They have been taken from their regular occupations and families and given a few dollars a day to be present. Sometimes they will not be allowed to go home at night. They will not be allowed to ask questions, and they cannot discuss any of your teaching among themselves. On top of that, everything you say will be challenged in an attempt to discredit your teaching or you personally. These challenges are not intended to clarify the truth of what you say, but are aimed at raising confusion in the minds of the students (called "reasonable doubt"). The challenges may even include teaching opposing ideas that may not be based on science. In the end, these students will be required to offer an opinion as to whether your teaching has any merit.

Sounds like fun, doesn't it? For those who have testified in court, the above scenario is not far from the reality of the courtroom experience.

Modern jurors have been raised on a strong diet of television, multimedia and computer graphics. As a result, jurors respond best to quick, stimulating and graphical presentations. They are less receptive to lectures using jargon. They have short attention spans and little patience for abstract ideas. Because only reasonable doubt is necessary for acquittal in most courts, opposing counsel need only produce confusion in the minds of the juror. This is easily accomplished with questioning techniques that attack credibility or by producing contrary experts who may engage in marginal science.

One solution is to present testimony in a stimulating graphical manner. Complex concepts can be presented in a graphical and sometimes animated form. This presentation can be repeated

during summation arguments by the prosecutor so that the juror is again exposed to the information.

Types of graphics

Teaching graphics packages are intended to present general concepts to jurors without dealing with specifics of a given case. Examples are mechanisms of long bone fractures in abuse, effects of diffuse axonal injury, and details of immersion burn patterns. This is a modern version of the blackboard and chalk teaching that has long been accepted as a proper function of expert court testimony. The advantages of using sophisticated graphics are obvious. There is a pitfall to be avoided in using these types of graphics,

however: The graphics must be accurate and consistent with current mainstream thought. An inaccurate representation may mislead jurors and lead to the possibility of a valid challenge. For example, a commonly seen animation of brain movement during shaking depicts the brain as being injured by striking the frontal and occipital skull. This graphic clearly is not consistent with

observed injury patterns or with accepted understanding of diffuse axonal injury. Teaching graphics packages must be detailed enough to be accurate and must be kept current with accepted concepts.

Case-specific graphics are created to present the specific evidence or injury patterns related to the case being tried. These graphics are particularly useful in cases involving multiple injuries or especially complex evidence.

Simulation graphics differ significantly from the other types of graphics in that they attempt to show exactly what happened in a given case. This type of graphic is most likely to undergo court scrutiny and challenge. It must be based on a solid foundation including, when appropriate, the concurrence of an accident reconstructionist or a biomechanical engineer, a knowledge of physics, and accurate and detailed measurements, to name a few examples of supporting information.

Graphics are developed with consideration not only of the audience, but also of the presenter, whether that individual is the attorney or the expert. The successful use of graphics in trial will still depend on the skills of the presenter, his or her comfort with the

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The presenter must be in command of the presentation and not let the graphics dictate the way a case is presented

Using graphics in court

Although graphic presentations have been more often used in civil cases than in criminal prosecutions, many prosecutors are now realizing the importance of using graphics to illustrate and clarify complex medical concepts relevant to child abuse charges. Many cases have resulted in acquittals or mistrials simply because the jurors could not understand the mechanism of particular injuries or the fact that some injuries are only consistent with one causal mechanism.

Courts throughout the United States have developed some fairly consistent rules for the use of computer graphic demonstrations. First, courts uniformly hold that if the graphics are merely intended to illustrate and make more clear the testimony of a qualified expert witness, the graphics should be admitted in the same way as any other chart, diagram or drawing. [See, e.g., *State v. Farner*, 2000 WL 872488, p 24 (Tenn. Crim. App. 2000) — “a computer visualization converts an expert witness’s testimony into something the jury can see.” And see *State v. Bauer*, 598 N.W.2d 352 (Minn. 1999) — pathologist’s expert opinion was illustrated by a graphic poster showing the defendant’s leg brace matched to scale with a mark on the victim’s leg — held admissible because illustrative of the expert opinion.] As long as the graphic accurately depicts and illustrates the expert’s opinion, it should be admissible in this context.

Second, when graphics are used to generally educate the trier of fact, they need only reflect the expert’s opinion and are judged based upon the scientific support for his or her opinion concerning the subject matter of the graphics. For instance, if the expert can say that the computer animation of the general mechanism thought to result in metaphyseal fractures of the legs is widely accepted in the medical field, this should be sufficient foundation for admission of the graphics for general education purposes. Most cases hold that neither the Frye test nor other local tests concerning novel scientific evidence apply in these situations. [See, e.g., *State v. Pierce*, 718 So 2d 806, 809 (Fla. Dist. Ct. App. 1997) holding that a computer animation must: (1) depict the opinion of a qualified expert; (2) be based upon facts reasonably relied upon by experts in the field; and (3) be a fair and accurate representation of what it purports to depict.]

Prosecutors report successful use of animated graphics concerning aspects of child abuse, although no appellate case law has yet been generated in these cases. Many prosecutors have obtained court rulings admitting graphics even from judges thought to be too traditional in their approach to allow such evidence. Some have reported obtaining confessions and working out plea arrangements after showing defendants and their attorneys the graphics created for the particular case. These prosecutors uniformly report that use of visuals has made the presentation of expert medical testimony easier.

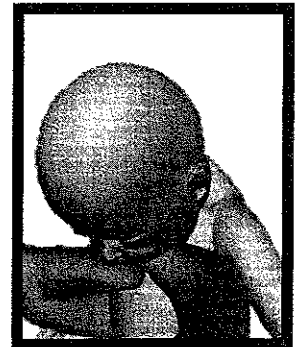
When the claim is made that the computer animation reenacts exactly what happened in the particular case, the scientific reliability of the demonstration, the facts upon which it is based, and the opinion of the expert witness must be shown with some particularity. For example, no one knows exactly how many times a baby’s head is whiplashed back and forth to cause the injuries unique to the Shaken Baby Syndrome, thus an expert opinion that a particular graphic demonstration is exactly the amount of force involved in the particular case and represents exactly how many times the head was shaken probably will not meet the standards for inherent scientific reliability. On the other hand, a ballistics expert, along with a qualified forensic pathologist, may well be able to meet the high requirements of reliability in reconstructing a shooting, based on scientific principles and the evidence from the autopsy. [See *State v. Harvey*, 649 So 2d 783, 788-789 (La. Ct. App. 1995).]

The highest requirement of showing scientific reliability is attached when data from an investigation or court proceeding is fed into a computer and the computer analyzes the data and offers a solution or answer. As many courts have said, in this latter scenario the computer itself is functioning as an expert and the proponent of the evidence must meet a high burden of scientific reliability of the computer program and the principles used to analyze the data and reach a result. This type of computer animation, called a “simulation,” has not been used in child abuse cases.

Specific graphics applications

Shaken Baby Syndrome

Graphics packages have been used for several years to teach the concepts of the Shaken Baby Syndrome. SBS is a constellation of unfamiliar and complex injury mechanisms that lend themselves to computer animation. Clear demonstration of these mechanisms is becoming more important with the appearance in the courtroom of oppos-



ing experts expounding marginal theories of injury.



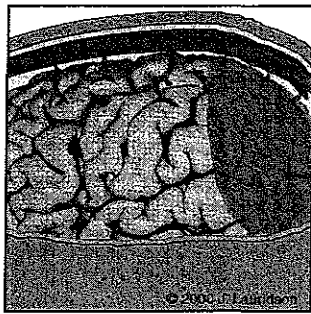
The National Center on Shaken Baby Syndrome offers a basic graphics package on SBS. It deals with the issues of the mechanics of the shaking, effects of impact, diffuse axonal injury, brain mechanical stresses, retinal hemorrhage, retro-orbital hemorrhage, subdural and subarachnoid hemorrhage, spinal cord injuries, rib fractures, acute and chronic changes on CT scans, non-accidental long bone fractures, presentation of “911” calls, and the presentation of a timeline. Recognizing the evolving

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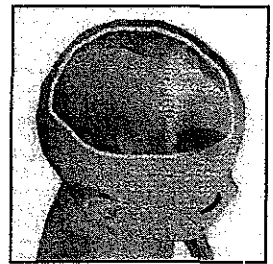
concepts in SBS and the need to maintain accurate representations, experts in various areas of SBS review these graphics to ensure their accuracy. Additionally, this basic graphics package is updated frequently.

The National Center also offers a case-specific graphics package that incorporates specific evidence such as CT/MRI scans, video statements, injury patterns, fractures, and timelines with the basic teaching graphics. Information is available on the Internet at the National Center on Shaken Baby Syndrome website: <http://www.dontshake.com/sbsmaterials.html>



Abusive Head Injury (non-shaking)

The mechanics of skull fracture, including colorized CT/MRI scans, can often be well demonstrated with graphics. Cerebral edema and subdural or subarachnoid hemorrhages are effectively represented using computer-based graphics.



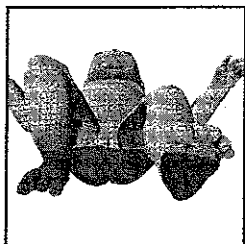
Abusive Long Bone Fractures



Nonaccidental long bone fractures and metaphyseal fractures can be clearly illustrated using computer graphics. Using radiographs, these graphics can be created for the details of a specific case.

Abusive Burns

Graphics can be used very effectively to illustrate splash and immersion burns. Very often actual photographs of these injuries are so disturbing that some jurors look away and thus do not comprehend the full extent and details of the injuries.



The use of specific and accurate 3-dimensional graphics allows complete illustration of burn patterns without shocking or offending jurors.

Education

As the graphics packages become more detailed and are maintained current with contemporary medical studies, their usefulness can be extended to teaching health care providers. Many primary care providers and specialists will be receptive to this stimulating approach to child abuse issues.

Resources

The National Center on Shaken Baby Syndrome, 2955 Harrison Blvd Suite 102, Ogden, UT 84403. Telephone 888-273-0071 Web site: www.dontshake.com.

