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EDITORIAL

Fear of Hope

For centuries, physicians have taken special pains to dash the hopes of people who have suffered spinal cord injury. Over 2000 years ago, an anonymous Egyptian physician recommended that water be withheld from spinal-injured warriors.* Until recently, clinical pessimism was so rampant that medical personnel often did not treat spinal cord injuries as true medical emergencies. Many clinicians felt compelled to tell patients and their families that they should not expect recovery from spinal cord injury, even though clinical and laboratory data suggest that some recovery is not only possible but likely. For example, the National Acute Spinal Cord Injury Study† showed that patients who arrive at hospitals with the slightest motor or sensory function below the injury site will typically recover 59% of lost motor function within a year. Even severely injured patients admitted with no voluntary motor or sensory function below the injury site typically recover 8% of their pre-injury abilities.

On page 2000 of this issue, Li *et al.* report an exciting finding that adds to a growing body of evidence indicating that regeneration and functional recovery can occur after spinal cord injury. The authors report that adult rat epithelial cells taken from the lining of the nose and transplanted into injured rat spinal cords significantly improve the ability of the animals to retrieve food pellets with their forepaws, presumably by encouraging regrowth of the severed axons. These results join and reinforce evidence from other groups, all reporting corticospinal regeneration and behavioral recovery in adult rats with injured spinal cords. Injured rats can be treated with antibodies that accelerate regeneration.‡,§ Or wounded spinal cords can be treated with genetically engineered cells or fetal cells or tissue to stimulate regeneration. ||,¶,# These encouraging results have been well publicized and some have criticized such studies for giving premature hope to the spinal injury community.

What is the harm of hope? Undue optimism may mislead some people to develop unrealistic expectations and suffer depression when these expectations are not met. Anticipation of impending cures may encourage many to postpone therapies that would benefit them today. A few may even find enthusiastic clinicians who are willing to apply unproven experimental therapies on them. Fortunately, effective checks and balances exist at many levels to stem false hope. Concern that journalists and the public may misinterpret scientific results often leads researchers to present clinically relevant results with greater circumspection. Scientific journal reviewers usually require a higher level of proof for clinically relevant claims. Responsible journalists usually check their sources carefully and provide balanced commentary from experts when reporting therapeutic safety and efficacy. Finally, people with disabilities are not so naïve. Balancing hope and reality is a daily struggle for them. All people with disabilities have lived through surges of hope resulting from media reports of "cures." Many have adopted the philosophy of planning for the worst but hoping for the best.

Spinal cord injury research is now poised at a crucial stage. Expectations of effective therapies for spinal cord injury have been raised. Although many neuroscientists are confident that such therapies will be developed, a wide gulf separates laboratory demonstrations of rats walking and effective human therapy. Migration of therapy from laboratory to clinic may take many years. Pessimists should not be telling people with spinal cord injury that they have no hope for recovery, nor should optimists predict availability of effective therapies within a short time frame. Future reports of spinal cord injury therapies must strike a careful balance between hope and reality. This balance should err on the conservative side but at the same time not deprive people of hope.

Wise Young

The author is professor and director of the neuroscience center at Rutgers University.

*J. H. Breasted, *The Edwin Smith Papyrus* (Univ. of Chicago Press, Chicago, IL, 1930). †M. B. Bracken *et al.*, *N. Engl. J. Med.* **322**, 1405 (1990); W. Young and M. B. Bracken, *J. Neurotrauma* **9**, S 397 (1992). ‡B.S. Bregman *et al.*, *Nature* **378**, 498 (1995); B. S. Bregman, P. S. Diener, M. McAtee, H. N. Dai, C. James, *Adv. Neurol.* **72**, 257 (1997). §C. C. Stichel, S. Hermanns, H. Luhmann, H. W. Muller, paper presented at the Fourth International Neurotrauma Symposium, Seoul, Korea, 23 to 28 August 1997 (*J. Neurotrauma*, in press). ||H. Cheng, Y. Cao, L. Olsen, *Science* **273**, 510 (1996). ¶R. Grill, K. Murai, A. Blesch, F. H. Gage, M. H. Tuszynski, *J. Neurosci.* **17**, 5560 (1997). #S. Kawaguchi *et al.*, paper presented at the Fourth International Neurotrauma Symposium, Seoul, Korea, 23 to 28 August 1997 (*J. Neurotrauma*, in press); Y. Iwashita, S. Kawaguchi, M. Murata, *Nature* **367**, 167 (1994).