

## NTDB® data points

# Thumbs up

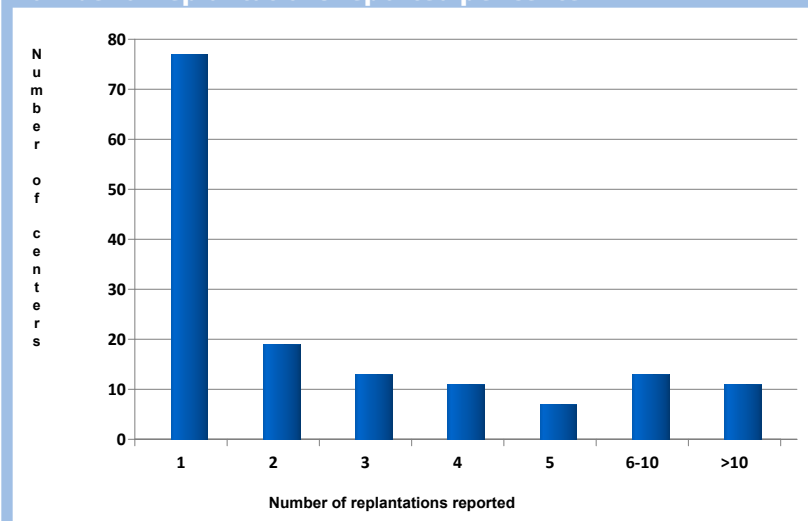
by Richard J. Fantus, MD, FACS; and John Fildes, MD, FACS

The English word “finger” has two meanings, even when referring to a single human hand. The first meaning refers to the four digits, not including the thumb; the second refers to any of the five digits of the hand. The first meaning of the word finger implies that the thumb is special. Many primates have opposable thumbs; however, the evolution of the fully opposable thumb is associated with *Homo habilis*, the forerunner of *Homo sapiens*. The opposable thumb has allowed the human species to develop fine motor skills, stone tools, and human functions such as the ability to write. The accidental loss of a thumb, or several fingers, would result in significant disability.

Microsurgery and replantation have evolved over the past 50 years, but they have their origins in the mid-1500s, when medical pioneers first developed techniques of vascular suture and vascular ligation. In the early 1900s, vascular surgery became a possibility, as a result of the experimentation efforts of Alexis Carrel, MD, and Charles Guthrie, MD. They performed transplantations and replantations of composite tissues, organs, amputated limbs, and kidneys in animals. In 1918, William H. Howell, PhD, and L. Emmett Holt, MD, developed heparin, which increased the

\*Tamai S. *Plast Reconstr Surg.* 2009;124(12):(6 Suppl:e282-94).

Number of replantations reported per center



numbers and success rates of these types of operations performed in humans. The first monocular microscope was used for ear surgery in 1921 by Carl Nylen, MD, followed closely in 1923, with the first use of a binocular microscope by Gunnar Holmgren, MD. Over the next 50 years, with the development of the Zeiss operating microscope, suture materials, and microsurgical instruments, microsurgery became a part of several surgical disciplines.\*

In order to examine the occurrence of replantations in the National Trauma Data Bank® research dataset 2008, admissions records were searched utilizing the International Classification of Diseases, Ninth Revision, Clinical Modifica-

tion (ICD-9-CM) procedure codes P84.2 (reattachment of extremity), including P84.21 through P84.24 (upper extremity), P84.25 through P84.28 (lower extremity), and P84.29 (other reattachment). A total of 508 incidents matched these P codes; 500 records had P codes for upper extremity, and seven records had P codes for lower extremity. These patients were 85 percent male, on average 36 years of age, had an average length of stay of 7.2 days, and an average injury severity score of 5.1, indicating that the majority of these were single-site injuries. The major mechanisms of injury categories for these records were machinery 212, cut/pierce 149, other specified 63, motor vehicle-related 21,

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transport other 17, struck by or against 16, fall 8, and natural/environment 6. There were 151 centers that performed more than 500 replantations in 481 patients (these data are depicted in the figure on page 46).

Loss of a thumb, several digits, or part of an extremity—especially the arm—can have devastating consequences. Even though the field of prosthetics is progressing by leaps and bounds and is evolving as fast as advancements in modern technology allow, lower extremity prosthetics have outpaced the level of sophistication of currently available upper extremity prosthetics. With the lack of a suitable substitute that can provide for precise fine motor movements, replantation remains the mainstay for injuries involving the upper extremity,

especially the thumb. For this reason, the majority of replants involve the upper extremity, and, specifically, attempts to save the thumb. There is nothing more rewarding than to make rounds and have the patient give you the thumbs up.

Throughout the year, we will be highlighting these data through brief reports that will be found monthly in the *Bulletin*. The *NTDB Annual Report 2009* is available on the ACS website as a PDF file and a PowerPoint presentation at <http://www.ntdb.org>. In addition, information is available on our website regarding how to obtain NTDB data for more detailed study. If you are interested in submitting your trauma center's data, contact Melanie L. Neal, Manager, NTDB at [mneal@facs.org](mailto:mneal@facs.org).

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