

Figure 1

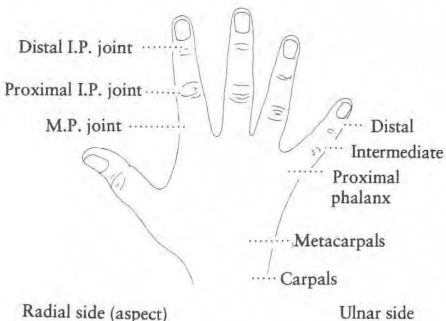


Figure 2

ANATOMY OF THE HAND

ABSTRACT

Precise reference to the elements of the hand and its movement is important to medical science. This brief, diagrammatic article orients the layperson to the most common terms.

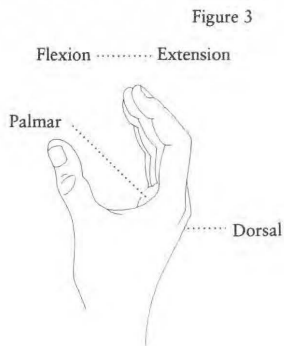


Figure 3

Each hand is a complicated organ of touch and movement. The two hands together with the brain form a powerful and subtle system of manipulation, sensation and communication.

There are fifteen bones within the hand, eight within the wrist and two in the forearm. Within the hand itself there are eighteen small muscles and more than a dozen muscles in the forearm that act on the hand through tendons. Various joints, ligaments, other structures and their interactions, as well as interactions with other parts of the body, ensure the complex activity of the hands. Complete description and analysis is beyond the scope of this paper, nevertheless, there is value in considering them at a simple level.

Standard names for the digits are used by physicians because otherwise mistakes can occur such as operating on the wrong finger. They are: thumb, index, middle finger, ring finger and little finger (figure 1).

The bones and joints of the hand have standard names in anatomy (figure 2). A phalanx (plural is phalanges) is one of the three bones in a finger or two in the thumb. The “distal” phalanx is the one at the tip, the next is the “intermediate” phalanx (except for the thumb), and the nearest is “proximal.” The five bones in the palm of the hand are known as the metacarpals. These are numbered from first to fifth, starting from the thumb side of the hand. The carpals, or carpal bones, are the eight small bones of the wrist.

Each finger has a proximal and distal interphalangeal joint (IP), while the thumb has only an IP joint. The metacarpophalangeal (MP) joint is the most prominent knuckle, or bone-end, in each finger-joint.

Special adjectives describe the aspects of the fingers, hand and forearm. The two bones of the forearm are the radius (which looks like the spoke of a wheel) on the thumb side, and ulna, explaining the adjectives “radial” and “ulnar.” “Palmar” (sometimes “volar”) and “dorsal” refer, respectively, to the palm and back of the hand and fingers (figure 3). “Thenar” and

“hypothenar” refer to the thumb and little finger, for example, “thenar eminence” is the ball of the thumb and “hypothenar eminence” is the raised area on the ulnar side of the palm.

Movements also have special names. In the case of the fingers, flexion is closing the joints into the palm of the hand and extension is the opposite movement. Abduction of a finger is moving it away from the midline of the hand and adduction is the opposite movement. For the thumb, these four movements take place at a right angle to those of the fingers. Movements of the hand consist of pronation or having the palm downwards (this can be remembered as “prrr” for the stroking of a cat) and supination or having the palm upwards (the way you would hold it to make a cup for holding something). Mid-pronation is half way between, with the thumb side of the hand uppermost. There are other names for more specialized movements and postures such as protraction, retraction and circumduction.

Hand grips and postures also have special names, such as power grip, pinch grip and precision grip. There are many other variations which are not standard.

More detailed information can be found in standard textbooks on anatomy or the surgery of the hand.

REFERENCE

Wood, Jones F. 1949. *Principles of Anatomy as Seen in the Hand*. London: Balliere Tindall and Cox.



**B I O G R A P H Y**

For the last twelve years, **Rosemary Sassoon** has been researching the educational and medical aspects of handwriting. This has included work at the Medical Research Council Applied Psychology Unit at Cambridge, and at several major hospitals, as well as international advisory work with education departments in Australia, Scandinavia and Malaysia. Her books on handwriting include: *The Practical Guide to Children's Handwriting*, *Handwriting: a New Perspective* and *Handwriting: the Way to Teach it*. She is currently working on a series of typefaces entitled "Sassoon Primary," which are meant to bridge the gap between reading and writing. The original design concentrated on details that make the acquisition of the skill of reading easier for children with learning difficulties.

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