Medical Illustrations: Hints For The Physician-
Author

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MEDICAL ILLUSTRATIONS:
HINTS FOR THE PHYSICIAN-AUTHOR

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Well planned manuscripts, lectures, and exhibits effect economy and prestige. It has been stated that 90% of what man learns he learns through his eyes; which, in the case of illustrations for scientific work, means clarity and accuracy as opposed to suggestion or impression.

The initial steps in utilizing visual aids in scientific writing are the productive steps which, if planned properly, make reproductive phases relatively trouble free. The object of this article is to present suggestions to the physician intending to use pictures with his text or exhibit — suggestions that will permit his fullest control as the 'initiator and will make for minimum delay in processing his ideas.

ILLUSTRATIONS

Although the medical illustrator is happy to discuss proposed illustrations on an informal basis, the necessary formality of a written request has every advantage. Such a request will establish priority and eliminate confusion relative to the date on which the finished work is due. The general scope of the work should be indicated, and notation made as to the purpose of the drawing. This is important because there are instances when one drawing can be prepared to serve several purposes. On the reverse side of the service request card, the time spent on that particular project may serve as useful information in a future undertaking of a similar nature (Fig. 1).

When illustrations are to be made during an operative procedure, it is obvious that a good vantage point for the illustrator is to everyone's benefit. This does not mean that he need be beside the patient, for there are other equally practical places to have him stationed, such as behind the anesthesia screen or on a high stool behind the operator or assistant. It should be pointed out that the illustrator who is the sole tenant of the space atop a stool is more apt to get better pictures with fewer questions asked than the illustrator who first at the table, then elsewhere, and intermittently back at the table.

Considering the audience who will view a picture and the time spent by the viewers will, to some degree, determine the nature of the illustration. It is a waste of facility to produce a complicated drawing when comprehensive simplicity serves the purpose better. As an example, the person listening to a speaker (and seeing slides) would have an extremely brief interval to digest new information or grasp a great amount of information that covered the entire screen. In this instance a simple, bold picture is effective, stimulating, and instantly understood (Fig. 2). The reverse is true in the case of an exhibit illustration where the viewers are prepared to spend as much time as they feel necessary. In the case of books and journal articles, the choice depends on space.

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While the average physician will not attempt to prepare his own rough drawings, he may, nevertheless, take advantage of tracing available reference material in order to provide the illustrator with a definitive idea. This cannot (and need not) always be done, but there are many times when ordinary typewriting paper can be placed on a book illustration and a reasonable series of contour lines drawn. It should be remembered that this is a "rough" only, but it will provide good landmarks for the additional information to be incorporated in it (Fig. 3).

Quite often specimens from the autopsy room are found unusual enough to warrant drawing. If it is at all possible, the doctors involved should call the illustrator to stand by as the specimen is being cut. If need be, several drawings can be made during the entire sectioning or inspection and the illustrator will have less difficulty in reconstructing the tissues. There is the obvious advantage of having the illustrator draw from the fresh specimen or briefly fixed specimen as opposed to the long stored and mis-shapen one.

If the occasion arises when a surgical procedure must be done late at night or on a week-end, and if this procedure yields noteworthy information that lends itself to drawings, the surgeon should do one of two things; i.e., call the illustrator or dictate a detailed description as soon as time permits. The problem of creating a lifelike field from the written word is not as difficult as it might sound.

Reference pictures that may be provided the illustrator should have the stamp of authenticity; it is easier to simplify than to build up. As an example, the face of the man during an epileptic seizure was modified from a photograph and presented no problem at all; whereas great difficulty would have been encountered had a "doodling" been the foundation for the finished drawing (Fig. 4).

At appropriate times, non-medical illustrations can be a delightful way to emphasize a point. This is especially true when presenting information to non-specialized audiences (Fig. 5).
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Figure 3

Figure 4
Reprinted, with permission, from the American Journal of Nursing, March 1957.

Figure 5

Figure 6

When the physician has gotten together a complete article and all the illustrations, he may wish to "crop" them himself. Not infrequently he will possess more photos than drawings and these are probably routinely sent to the publisher to be printed as is. Much space may be wasted; many times the focal point is minimized. If a simple frame (angles) and paper clips is devised, this will provide an adjustable window for him to view each picture as he would like it to appear in print. It
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is surprising how much can be omitted, all to the good of emphasizing the main point of interest (Fig. 6).

Photography and drawing can combine beautifully. This is an especially useful technique to use where a series of subjects is to be shown. It is far less trouble to print six photos and do art work on them than to make six slightly different drawings of the same subject (Fig. 7).

![Figure 7](image)

There are some typewriters which produce light open letters which very closely resemble neatly done hand-lettering. If such an instrument is available, the physician can have the labels typed and arrange them as he thinks best by rubber cementing them to the drawing. These can be removed and/or replaced without having to alter the drawing per se (Fig. 8).

When sending drawings or photographs to the publisher, it is recommended that these be backed by heavy cardboard and not affixed to the appropriate page in the manuscript on manuscript paper. It is, of course, a risk to write on the reverse side of a photograph as the impression has been known to appear as an imperfection in the printed picture (Fig. 9).

In planning illustrations for a book, it makes for easier reading if illustrations of comparable technique are near each other. This need not mean that half-tone drawings and photos cannot appear side by side with line drawings, but it does imply that delicacy juxtaposed to boldness is undesirable.

A friend or patient may be an excellent commercial artist for a newspaper, and he should be allowed to remain an excellent commercial artist for a newspaper.
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Rhomboids, major & minor

Humerus adducted and externally rotated

Figure 8

This comment is not meant to be acrimonious, and there are obviously acceptable variations to the rule. But, by and large, a specialist will have little trouble in executing an assignment quickly.

One drawing may impart information that could not be presented effectively by any other means. As an example, several photographs of a dissected brain showing structures associated with the visual system would be far inferior to a semi-diagramatic drawing utilizing information from clinical studies, etc. (Fig. 10). In this particular instance it was necessary to develop a system of dot and line patterns to carry the retinal information back through the structures depicted, but this same drawing could be reproduced as a negative slide and color added for more ready visualization. If the drawing requires labels, it is far more satisfactory to indicate them (precisely) on an overlay sheet so that the illustrator will have no problem in directing the leader line or arrow to the exact spot. All too often, especially in photomicrographs, a grease pencil is used on the acetate cover to indicate where an arrow should point. These grease pencil markings are not accurate enough in most cases; it is better to use a straight pen and India ink. In all instances it is better to be hyper-critical or painstakingly exact in preliminary work and the physician who constructively criticizes sketches prepared for him is a much appreciated patron. It is too late, when the article is in print, to apologize for a quickly done piece of art work or a carelessly planned picture. The instances when such drawings are redone for future publication are rare.
Doctors planning to have illustrations prepared should decide basically whether they need color or line or tone drawings. Where topography only is important, it is foolish to have a colored picture made. Color work takes longer and will often times lack the depth of field when printed as a black and white picture. Furthermore, line drawings can be reduced with relative freedom and can be printed on a variety of paper stock. Half-tones are reasonably adaptable to variation in size and quality of paper stock, but color work requires very special handling and can be printed satisfactorily only on coated stock.
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CHARTS AND GRAPHS

Again, a written request should stress pertinent data and the intended use. Some journals have specific requirements as to size, etc., and it is well to know this before drawings are begun. Ideal for development of a graph is blue line or green line graph paper. Above all, avoid using rough paper. Attempt to relieve plotted information with a more meaningful presentation if possible. Here we show one set of facts in two ways. The second obviously has more impact — and incidentally makes use of the book tracing mentioned previously (Fig. 11).

An ordinary pencil of medium softness permits easy erasures. Colors can be indicated, or colored crayons can be used when "rough" is completed.

You might wish to select a plastic template that suits your needs. There are numerous kinds available with such things as arrows, benzene rings, flasks, etc., or a sheet of clear x-ray film can be used, appropriate and much used symbols being cut with a razor blade or Bard-Parker knife.

Commercially available symbols can save lots of time if you do your own inking. A variety of numbers, arrows, symbols can be purchased which, being wax-backed, can be pressed on the picture or chart. Special sheets can be made up. It is a good idea to get the publisher's views by reading his guide-book.

Use commercially available gummed tapes for large wall charts that you want to do yourself. All colors and patterns are available in many widths, and a simple series of bars or lines can be applied to cardboard or blackboard in less time it would take to show the illustrator what is wanted.

Write "top", size, and typewrite legends when you send your illustrations to the publisher. There are occasions when a record of some kind reaches him and of its very nature there are no numbers or letters to tell him how or where to place a picture. If you want to borrow from a publisher, it is better to borrow the engraving than to re-photograph the printed reproduction. Obviously, the clearest print will come from the original plate.

EXHIBITS

The author is prime mover and final judge. The illustrator is his agent for getting other wheels of motion started. (If either becomes disengaged, there is apt to be a mess instead of a mesh).

Especially important are the names of all persons contributing information for its production. Provide correct duplicate typed copy to all co-authors and to the Illustration Department.

Hours spent on a scale model may save weeks on the full scale product. Label difficult to identify material carefully and consistently. This is especially true of x-rays, which should be marked "top" and should have the location (according to the scale model exhibit) written on tape that is affixed to them.

If you take your own pictures, try to provide a neutral or contrasting background.
Humility can be over-done; bigness can belittle you. Many times excellent material is displayed in an exhibit hall in a manner that suggests haste, poverty, or lack of enthusiasm. At other times, one sees the reverse. A poor design can ruin an excellent message; a good design can enhance an excellent message.

Plan weekly conferences and inspection sessions. Again, it is to be stressed that an hour spent may be 10 hours saved.

Whether it be a drawing, chart, photo or exhibit, the physician-author will find it an exhilarating experience if he will utilize ways to prepare work for the illustrator.