

Terminologia Anatomica: New Terminology for The New Anatomist

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Over many years, anatomical terminology has been the subject of much controversy and disagreement. Previously, the International Anatomical Nomenclature Committee has been responsible for the production of six editions of *Nomina Anatomica*. In 1989 a new committee, the Federative Committee on Anatomical Terminology (FCAT), was created by its parent body, the International Federation of Associations of Anatomists (IFAA). FCAT has worked for 9 years and published *Terminologia Anatomica* (TA) in 1998. FCAT's aim has been to democratize the terminology and make it the internationally accepted, living language of anatomy. The worldwide adoption of the same terminology would eliminate national differences, which were causing extreme confusion in instances where the same structure was known by several names. The new terminology is thus the result of worldwide consultation and contains Latin and equivalent English terms. It is indexed in Latin and English and contains an index of eponyms in order to find the correct non-eponymous term. The future goal of FCAT is to continue to improve the terminology—new structures are described, different terms come into use, and the terminology needs to be expanded to include terms used by clinicians for structures that currently do not appear in the list. Future versions of the terminology must accommodate the needs of all who use it, both in the clinical and scientific worlds. *Anat. Rec. (New Anat.): 257:50–53, 1999.* © 1999 Wiley-Liss, Inc.

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Anatomical terminology has been the subject of considerable controversy and disagreement. The Federative Committee on Anatomical Terminol-

ogy (FCAT), a committee of the International Federation of Associations of Anatomists (IFAA), has just published *Terminologia Anatomica* (TA).¹ It is hoped that this publication will provide a vehicle for international agreement. This article explains the birth of FCAT and the reasons for its creation, why terminology needs to be standardised, how *Terminologia Anatomica* is put together and why terminology will continue to develop and need to be standardised.

FORMATION OF FCAT

In 1989 the General Assembly of the IFAA created the Federative Committee on Anatomical Terminology, whose objectives were defined:

"To present the official terminology of the anatomical sciences after consultation with all the members of the International Federation of Associations of Anatomists, thus ensuring democratic input to the terminology."

FCAT was created in response to

international dissatisfaction with the work of the International Anatomical Nomenclature Committee (IANC), which had previously been responsible for anatomical terminology and had published the *Nomina Anatomica* (NA) for its six editions. The FCAT committee consists of 20 members who come from 16 countries in all five continents. They are supported financially by the anatomical societies of the countries in which they reside, although the degree of such support varies enormously according to the financial situation of the parent society.

THE INCEPTION OF *TERMINOLOGIA ANATOMICA*¹

Since its creation, FCAT met 14 times in 12 different countries, often in association with an international anatomical meeting. There were early attempts to establish a working relationship with the previous terminology committee (IANC). However, these overtures were not reciprocated by the IANC. Following the realisation

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The *Terminologia Anatomica* [ISBN 0-86577-808-6 (The Americas); 3 13 114361 4 (rest of world)] is also available with CD-ROM [ISBN 0-86577-809-4 (The Americas); 3 13 115251 6 (rest of world)] from Thieme, 333 7th Avenue, New York NY 10001; 212-760-0888; Fax 212-947-1112.

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TABLE 1. An example of part of the cardiovascular system chapter

A12.2.12.012	Truncus coeliacus	Coeliac trunk*
A12.2.12.013	A. gastrica sinistra	Left gastric artery
A12.2.12.014	Rr. oesophageales	Oesophageal branches*
A12.2.12.015	A. hepatica communis	Common hepatic artery
A12.2.12.016	A. gastroduodenalis	Gastroduodenal artery
A12.2.12.017	(A. supraduodenalis)	(Supraduodenal artery)
	A. pancreaticoduodenalis superior	Posterior superior pancreaticoduodenal artery
A12.2.12.018	posterior	
A12.2.12.019	Rr. pancreatici	Pancreatic branches
A12.2.12.020	Rr. duodenales	Duodenal branches

*Indicates an alternative spelling—celiac and esophageal.

that collaboration with IANC was not possible, FCAT meetings were organized as several day-long sessions spent discussing the anatomical terms. FCAT has worked towards its objectives by reviewing and revising the Latin terminology (taking the 5th edition of NA as the starting point), with the addition of a list of English terms in common use. Unnecessary change has been avoided wherever possible, and many alternatives in common usage have been adopted in order to encompass the variable way in which the terminology is used in different countries. During 1996 a final draft of the terminology for macroscopic anatomy was sent to all member associations of IFAA for comment. Following this, FCAT has met several times to incorporate many of the suggestions received.

In *Terminologia Anatomica*,¹ which was published in the later part of 1998, terms are laid out in three columns, with each term in Latin accompanied by the term in current usage in English speaking countries. Alongside each pair is a unique identifying number. The order of terms follows the anatomy naturally through each system. Indenting and styles of heading are used to indicate the relationship of one term to another (Table 1). Footnotes explain why some terms have been chosen. The book is completed by a comprehensive index for Latin and English terms and an index of eponyms which identifies the number of the appropriate non-eponymous term.

FCAT continues the previous accepted use of Latin for the definitive terminology. Readers may wonder why

Latin is still used in the terminology. The reasoning is that Latin is a dead, and thus not evolving, language, and it does not exclusively belong to one country or people. Its use in the terminology is thus designed to be global and non-secular.

In view of the widespread use of English by many countries, and in the majority of scientific publications, the committee decided to provide a list of equivalent English terms in current usage. These terms are not necessarily translations of the Latin terms, but are simply the equivalent English terms in common usage. To accommodate the variation in English between different countries, a list of acceptable alternative spellings is included (see Table 1).

With greater travel and communication it is now likely that a patient with notes in one country may be treated in another. Inconsistent terminology can lead to disastrous consequences. In Brazil, the use of cubitus for the ulna leads to confusion when elsewhere it describes the area in front of the elbow joint. Numbering rather than naming digits in the hand is another problem. In the Latin terminology there are five digits which are always numbered with one as the thumb, and five as the little finger. However in English there are fingers and a thumb. It is not clear which the third finger is—middle or ring. Thus the digits in the hand are named thumb, index finger, middle finger, ring finger, and little finger.

The committee has continued the previous standard in not using eponyms. Despite their historical interest, honouring those who had first described, drawn attention to, demon-

strated the meaning of, or correctly interpreted a particular structure, eponyms give absolutely no anatomical information about the named structure, and vary considerably between countries and cultures. For example: Grynfeldt's triangle and Lesshaft's space or triangle are both names for the inferior lumbar triangle and Bertin's ligament and Bigelow's ligament are both names for the iliofemoral ligament.

FCAT has taken the opportunity to revise the neuroanatomical terminology to accommodate current use as demonstrated in recent publications. The changes in neuroanatomy have focused, in general, on 1) clarifying what is actually meant by some previous officially recognized terms, 2) introducing new terms that have been in wide use for many years but never officially recognized and, 3) verifying previous terms. In addition, each subsection (e.g., spinal cord, medulla oblongata, etc.) is organized by subheadings so the entire neuroanatomy part of the terminology is quite user-friendly, in common with the rest of TA.

One example of clarifying a previous term concerns the inferior cerebellar peduncle. Earlier lists have specified this structure as one entity without qualification. However, for many years the primary literature has clearly identified two parts of the inferior cerebellar peduncle, a larger lateral part, the corpus restiforme (restiform body) containing olivo-spinocerebellar fibers and many other fiber populations, and a smaller medial part, the corpus juxtarestiforme (juxtarestiform body), containing only fibers that interconnect cerebellar and vestibular structures. Thus TA specifies an inferior cerebellar peduncle that is composed of a restiform body and a juxtarestiform body.

New terms in neuroanatomy that are now official, as indicated by their listing in TA, have been in widespread common usage, some for decades. They encompass all regions of the brain and spinal cord. For example, in the white matter, new terms include hypothalamospinal fibers, the antero-lateral system (and its constituent parts), and the accessory medullary

lamina of the basal nuclei. In the grey matter new terms include names of the individual raphe nuclei, more of the diencephalic nuclei, and the subhypoglossal nucleus. Many of these newly recognized terms have particular relevance to clinical neurology.

Other changes in the terminology include an update of the terms used to describe the urethra. In order to conform with modern understanding of the region, the term for the junction of ileum, caecum, and ascending colon has been revised to accommodate the current thinking that it is not a valve but an orifice. Thus the ileocaecal valve has become the ileal orifice. The term prostate gland has been changed to prostate, as the structure is much more than just a gland. Also the subdivisions have been updated to the more modern terminology in current use by clinicians.

Having been adopted by the IFAA, the *Terminologia Anatomica* supercedes all previous lists of anatomical terminology.

THE FUTURE

FCAT recognises that its work will continue indefinitely—new structures are described, different terms come into use, and the terminology needs to be expanded to include terms used by clinicians for structures that currently do not appear in the list. Also until now Anatomical Terminology has been selected and monitored only by Anatomists (although many of them have been clinically qualified in the past). Future versions of the terminology need to accommodate the needs of all who use it, both in the clinical and scientific worlds. The new book thus invites corrections/changes by post or email, and the website for the IFAA (<http://www.ifaa.lsumc.edu/>) supports feedback. FCAT is continuing work on histology, cytology, embryology, dental terminology, and anthropology, and hopes to present works of these subjects in published form soon. Future plans include a dictionary of anatomical terms, an illustrated terminology, and electronic versions of all publications.

FCAT's aim has been to democratize the terminology, and to make it the living language of anatomy; a language that is internationally accepted

and recognized. The worldwide adoption of the same terminology would eliminate national differences, which were causing extreme confusion for structures with multiple common names.

ACKNOWLEDGMENTS

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LITERATURE CITED

1 FCAT. 1998. *Terminologia Anatomica: International Anatomical Terminology*. Stuttgart, New York: Thieme.

APPENDIX: A BRIEF HISTORY OF THE COMMITTEES INVOLVED IN ANATOMICAL TERMINOLOGY

The first published list of anatomical terms, the "*Basle Nomina Anatomica*" (BNA), appeared in 1895, in Latin. Unfortunately it was used only by German-speaking, Italian, U.S., and Latin American Anatomists.

When the IFAA was formed in 1903, its primary objective was the selection of a uniform anatomical nomenclature. Two years later at the first Federative International Congress of Anatomy (FICA), and in 1910 at the second FICA, the principal topic of discussion was the nomenclature, and a committee to reform the terminology of Embryology was created. There was no progress in terminology in 1930 at the third FICA.

In 1933 the Anatomical Society of Great Britain and Ireland updated the BNA, presenting the Birmingham Revision (BR). The Anatomische Gesellschaft in 1935 also revised the BNA creating the Jenaer or Jenenser *Nomina Anatomica* (JNA). American and Japanese anatomists had drawn up their own lists and confusion recurred.

At the fourth FICA in 1936, a new International Anatomical Nomenclature Committee (IANC) was appointed. However, it was unable to meet because of the War (1939–1945).

In 1950, the fifth Federative International Congress of Anatomy directed its President to appoint a new IANC.

The new Committee met in 1952 and 1954, funded by grants from the Council for International Organizations of Medical Sciences (CIOMS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). They worked from the BNA (1895), as the JNA (1935) included changes considered too drastic and had abandoned the orthostatic anatomical position.

The sixth FICA in 1955 set up a permanent "Anatomical Nomenclature Committee to consider proposed additions and alterations to this list of terms, with authority to insert such additions and alterations as met with its approval, subject to confirmation by the next ensuing International Congress of Anatomists." The congress also unanimously approved the *Nomina Anatomica* (NA), a conservative revision of the BNA, which was then published in 1956 by Williams and Wilkins. It included the names of structures discovered since the BNA (1895) (1,354 names), with no eponyms, the grand total reaching 5,640 terms. At the seventh FICA the histology and embryology subcommittees were formed. In 1961, the second edition of *Nomina Anatomica* was published and reprinted in 1963.

In 1965 at the eighth FICA, the IANC welcomed as observers a number of veterinary anatomists, who were already discussing Veterinary Anatomical Terminology. Among several recommendations and amendments it was agreed to use Latin for all terms, and that the Embryology and Histology Subcommittees should retain their close association with the parent IANC. In order to obtain financial support for the Committee, an annual subvention from all the Anatomical Societies (US\$ 0.25 per capita) was approved, which was expected to attract additional support from other agencies or Foundations.

In 1966, the 3rd edition of *Nomina Anatomica* was published, with an index, by the Excerpta Medica Foundation.

During the ninth FICA World Congress in 1970 it was agreed to publish in one volume the *Nominae Anatomica, Embryologica et Histologica*. At the tenth FICA in 1975, the IANC approved the *Nominae Anatomica, Embryologica et Histologica*, and in 1977,

the fourth edition of *Nomina Anatomica* was published with *Nomina Embryologica* and *Nomina Histologica*, by Excerpta Medica.

In 1979, the IV International Symposium on the Morphological Sciences (ISMS) sponsored a meeting of the IANC. For the first time the Committee and Subcommittees met at the same site. At the eleventh FICA in 1980, the IANC and the Veterinary Anatomical Nomenclature Committee both met. Following approval by the congress, the fifth edition of *Nomina Anatomica*, the second edition of *Nomina Histologica* and of *Nomina Embryologica* were published (without an index) in 1983.

At the 1985 World Congress (twelfth FICA), IANC met. A proposal to change the IANC into an Editorial Board,

independent from the IFAA and thus not subject to approval of the Federative Member Associations was, after a long discussion, dropped. In response to suggestions from many anatomical societies to revamp the IANC, the officers of the IFAA attempted to implement a democratic process of election of new members to the IANC. This was rejected by the Chairman and Secretary of the IANC, stating that: "...based on historic facts, the International Federation of Associations of Anatomists had no jurisdiction over the International Anatomical Nomenclature Committee."

From 1985 to 1989, the officers of the IFAA and the presidents of the anatomical societies made repeated attempts to bring the impasse over the nomenclature committee to a resolu-

tion, but all approaches to IANC were rebuffed. The IANC published the sixth edition of *Nomina Anatomica* in 1989, without the approval of the IFAA or the thirteenth FICA.

At the World Congress in 1989, the General Assembly unanimously approved the creation of a new Federative Committee on Anatomical Terminology (FCAT), and elected its 12 initial members. The president of the IFAA underlined the fact that FCAT was an IFAA committee, which belonged to all anatomical societies. The FCAT would democratically prepare and publish the terminology of all biomorphological sciences. Within its budget, the IFAA would finance FCAT, and the copyright of all publications belong to the IFAA through FCAT.