BRITISH STANDARD

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Terms relating to surgical implants —

Part 4: Glossary of orthopaedic surgical terms

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Committees responsible for this British Standard

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British Orthopaedic Association
British Steel Industry
British Surgical Trades Association Incorporated
Department of Health and Social Security
National Association of Drop Forgers and Stampers
Royal College of Surgeons of England
Royal Veterinary College
Society of Thoracic and Cardiovascular Surgeons

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Contents

Foreword

This British Standard has been prepared under the direction of the Surgical Instruments and Medical Equipment Standards Committee.

Advancements in the field of implant surgery proceed by the collaborative efforts of those skilled in a number of diverse activities, each having a specialized language. Definitions of terms relating to surgical implants were prepared with two main purposes in view, namely:

a) to promote precision and uniformity in the use of terms relating to the various aspects of surgical implants;

b) to enable workers in different fields to understand one another.

The intention has been to provide information on terms used in the biological, medical, engineering and materials science aspects of surgical implants. It is emphasized that many of the terms included in this Part of BS 6324 will be found in British Standards directly concerned with particular disciplines, as well as in many text books. The wording of these definitions has in some instances been modified to facilitate understanding of the concepts by readers who are not specialists in these particular disciplines; the definitions are not otherwise incompatible with the general definitions as used and understood in the relevant industries. Every attempt has been made to align terms and definitions with modern practice. This glossary does not purport to be a comprehensive listing of all terms used in connection with surgical implants and has been restricted to those terms most frequently used. Where terms are considered to be deprecated, this has been stated.

The glossary has been prepared in four Parts as follows:

— *Part 1: Glossary of general medical terms;*

— *Part 2: Glossary of terms relating to mechanics;*

— *Part 3: Glossary of terms relating to materials;*

— *Part 4: Glossary of orthopaedic surgical terms.*

Further consideration is being given to the preparation of other Parts covering such fields as cardiovascular, neurosurgical and genito-urinary implant surgery.

Attention is also drawn to the Parts of BS 3531 dealing with surgical implants.

Each term in the glossary has been allocated a number of the type 40101 where the first three digits indicate the section number and the first digit of that group indicates the Part of the glossary. The remaining two digits give the term number within the section.

Where two or more terms have the same meaning, the preferred term is given in bold type and the other terms are given in medium type and, if deprecated, are so indicated.

An alphabetical index of the terms contained in each Part of the glossary is given at the end of that Part. Those terms given in italic type-face in the definitions are themselves defined elsewhere in the same Part and are included in the index for ease of reference.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 34, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 401. Anatomy and physiology: general

No.	Term	Definition
40101	**skeleton**	The bony and cartilaginous framework of the body, divisible into the axial skeleton [the *skull*, the *spine*, the *ribs*, the *sternum* and the pelvis (see Part 1 of this standard)] and the appendicular skeleton (the *bones* of the upper and lower limbs).
40102	**vertebral column** spine spinal column	That part of the axial *skeleton* of the body composed of multiple individual units (the *vertebrae*), the *sacrum* and the *coccyx*, together with the *invertebral discs*. NOTE The vertebral column has seven cervical, twelve thoracic (or dorsal), five lumbar, five sacral and usually four coccygeal vertebrae. The *sacral* vertebrae are fused together and the *coccygeal* vertebrae are rudimentary. Vertebrae of different regions vary greatly; the first cervical (atlas) and the second cervical (axis) vertebrae are particularly specialized and the thoracic vertebrae articulate with the *ribs*. See also 40216.
40103	**upper limb girdle**	That part of the skeleton comprising the collar bone (*clavicle*), the shoulder blade (*scapula*) and the associated *joints* and formerly called the shoulder girdle. NOTE There are two upper limb girdles: right and left. Contrast with *lower limb girdle*.
40104	**shoulder**	That part of the body between the *upper limb girdle* and the *arm*.
40105	**axilla** armpit	The hollow under the *shoulder* between the *arm* and the chest wall.
40106	**arm**	In anatomy. That part of the upper limb (see Part 1 of this standard) between the *shoulder* and the *elbow*, the bone of which is the *humerus*.
40107	**elbow**	That part of the upper limb between the *arm* and the *forearm*.
40108	**antecubital fossa**	The area overlying the front of the *elbow joint.*
40109	**forearm**	That part of the upper limb between the *elbow* and the *wrist*, the *bones* of which are the *radius* and the *ulna.*
40110	**wrist**	That part of the upper limb between the *forearm* and the *carpus.*
40111	**hand**	That part of the upper limb (see Part 1 of this standard) distal to the *wrist* and including the *palm*, the *thumb* and the *fingers*.
40112	**palm**	The anterior (see Part 1 of this standard) aspect of the *hand* excluding the *thumb* and the *fingers*; it includes the thenar eminence at the base of the thumb and the hypothenar eminence at the base of the little finger.
40113	**palmar** volar, *deprecated*	(adjective). Pertaining to the *palm* of the *hand*. NOTE Compare with *plantar* and contrast with dorsal (see Part 1 of this standard).
40114	**thumb**	The first and most lateral *digit* of the *hand* containing two *bones:* the proximal and the distal (see Part 1 of this standard) *phalanges*.
40115	**fingers**	The medial four *digits* of the *hand* comprising the index finger which is the most lateral (see Part 1 of this standard), the middle (long) finger, the ring finger and the little finger which is the most medial (see Part 1 of this standard); each finger contains three *bones:* the proximal, the middle and the distal (see Part 1 of this standard) *phalanges.* NOTE Fingers should be named and not designated by number. See Figure 1.

No.	Term	Definition
40116	**lower limb girdle**	That part of the skeleton comprising the two *os coxae* (hip bones) together with the *sacrum* and their associated *joints*, bounded by the buttock, the loin, the groin (see Part 1 of this standard) and the *thigh* and formerly called the pelvic girdle.
40117	**hip**	That part of the body between the *lower limb girdle* and the *thigh*.
40118	**thigh**	That part of the lower limb between the groin (see Part 1 of this standard) and the *hip* and above the *knee*, the bone of which is the *femur*.
40119	**knee**	That part of the lower limb between the *thigh* and the *leg* around the *knee joint*.
40120	**popliteal fossa**	The area at the back of the *knee joint*.
40121	**leg**	In anatomy. That part of the lower limb, comprising the *shin* and the *calf*, between the *knee* and the *ankle*, the bones of which are the *tibia* and the *fibula*.
40122	**shin**	The hard, anterior part of the *leg*.
40123	**calf**	The posterior part of the *leg*.
40124	**peroneal** fibular	(adjective). Pertaining to the lateral aspect of the *leg*.
40125	**ankle**	That part of the lower limb between the *leg* and the *foot*.
40126	**foot**	That part of the lower limb (see Part 1 of this standard) distal to the *ankle*.
40127	**sole**	The under surface of the *foot*.
40128	**plantar** volar, *deprecated*	(adjective). Pertaining to the *sole* of the *foot*.
40129	**heel**	The posterior part of the *foot* and the *sole* related to the *calcaneum*.
40130	**instep**	The area between the *heel* and the *ball of foot* including the medial longitudinal arch.
40131	**ball of foot**	The distal part of the *sole* between the *instep* and the *toes*.
40132	**hindfoot**	The posterior half of the *foot* related to the *tarsal bones* and including the *heel*.
40133	**forefoot**	The distal part of the *foot* related to the *metatarsal bones* and including the *ball of foot*.
40134	**toes**	The *digits* of the foot comprising the first toe (great toe or *hallux*) (containing two bones: the proximal and the distal *phalanges*); the second to the fifth toe (containing three *bones* each: the proximal, the middle and the distal phalanges); the fifth toe is also called the little toe. NOTE See Figure 2.
40135	**digit**	The *thumb*, any *finger* or any *toe*.

Section 402. Bones and cartilages

No.	Term	Definition
40201	**bone**	An individual element of the *skeleton*. NOTE See also Part 1 of this standard for bone tissue.
40202	**epiphysis**	The growth region of a *bone*. Initially composed of hyaline cartilage (see Part 1 of this standard) later acquiring a bony centre which gradually replaces the cartilage. (adjective: epiphyseal.) NOTE A surface may persist to form the articular cartilage (see Part 1 of this standard) of the adjacent *joint*, and another adjacent to the shaft of the bone (*diaphysis*), which forms the epiphyseal cartilage plate (see Part 1 of this standard), disappearing when growth ceases.
40203	**apophysis**	The growth region of a *bone* related to the insertion of a tendon (see Part 1 of this standard). (adjective: apophyseal.)
40204	**diaphysis**	That part of the *bone* between the *epiphyseal* plates (see Part 1 of this standard) or their sites. (adjective: diaphyseal.)
40205	**shaft**	The *diaphysis* of a long *bone*.
40206	**metaphysis**	The end of the *diaphysis* of a long *bone* adjoining the *epiphysis*. (adjective: metaphyseal.)
40207	**periosteum**	The membrane on the free surface of the *bone*. (adjective: periosteal.) NOTE Compare with *perichondrium*.
40208	**perichondrium**	The membrane on the free surface of a non-articular *cartilage* (see Part 1 of this standard). (adjective: perichondrial.) NOTE Compare with *periosteum*.
40209	**condyle**	The rounded expansion forming part of the end of a *bone* adjacent to the *joint* (e.g. medial and lateral (see Part 1 of this standard) femoral condyles at the *knee*). (adjective: condylar.)
40210	**epicondyle**	The projection from the *condyle* (e.g. medial and lateral (see Part 1 of this standard) humeral epicondyles at the *elbow)*.
40211	**tuberosity**	The broad eminence on a *bone*, often giving an attachment to a ligament or a *muscle*, and especially a tendon (see Part 1 of this standard) (e.g. the greater and lesser tuberosities at the upper end of the *humerus*).
40212	**tubercle**	a) A small *tuberosity*. b) In pathology. A nodule in tissue (notably the lesion characteristic of tuberculosis).
40213	**trochanter**	A projection at the upper end of the *femur*, elsewhere called a *tuberosity*. NOTE The greater trochanter is a large projection at the upper end of the femur to which the *abductor* muscles of the *hip* (gluteus medius and minimus) are attached. The lesser trochanter is a prominent process below the neck of the femur to which the main flexor muscle of the hip (iliopsoas) is attached.
40214	**trochlea**	A structure acting as a pulley, e.g. the trochlea of the lower end of the *humerus* which articulates with the trochlear notch on the *ulna*. (adjective: trochlear.)
40215	**sesamoid bone**	The seed-like *bone* developed in a tendon (see Part 1 of this standard) which moves over the bony prominence.

No.	Term	Definition
40216	**vertebra**	An individual *bone* of the *vertebral column*. (plural: vertebrae, adjective: vertebral.) NOTE A typical vertebra comprises a cylindrical body with an arch posteriorly forming part of the vertebral canal that contains the spinal cord and the spinal nerves with coverings (meninges). The vertebrae are separated by intervertebral discs, comprising a peripheral annulus fibrosus and a central nucleus pulposus. See also 40102.
40217	**sacrum**	The fused sacral *vertebrae* lying caudal (see Part 1 of this standard) to the lumbar vertebrae and articulating with the *os coxae*. (adjective: sacral.)
40218	**coccyx** tail bone	That part of the *vertebral column* consisting of usually four rudimentary *vertebrae* lying caudal (see Part 1 of this standard) to the *sacrum*. (adjective: coccygeal.)
40219	**sternum** breast bone	The *bone* forming the anterior mid-line part of the *skeleton* of the chest wall; it articulates with the inner end of the *clavicle* and the costal cartilages. (adjective: sternal.)
40220	**rib**	A curved bony strut lying in the chest wall. NOTE There are twelve pairs of ribs. Posteriorly (see Part 1 of this standard) they articulate with the thoracic *vertebrae*; anteriorly (see Part 1 of this standard) the upper ten pairs are fused to the costal cartilages which articulate with the *sternum*.
40221	**clavicle** collar bone	A *bone* forming a part of the *upper limb girdle*. (adjective: clavicular.) NOTE The medial (see Part 1 of this standard) end of the clavicle articulates with the upper part of the *sternum* and the outer end articulates with the acromiom process of the *scapula*.
40222	**scapula** shoulder blade	A roughly triangular flat *bone* forming part of the *upper limb girdle*. (adjective: scapular.) NOTE It is characterized by two processes, the acromiom and the coracoid, and the shallow oval articular surface, known as the glenoid cavity. The acromiom process articulates with the outer end of the *clavicle*; the glenoid cavity articulates with the *humerus*.
40223	**humerus**	The bone of the upper *arm*. (plural: humeri, adjective: humeral.) NOTE The proximal end (see Part 1 of this standard) is characterized by the convex head and two *tuberosities*. The head articulates with the glenoid cavity of the *scapula* forming the *shoulder joint*. The distal end (see Part 1 of this standard) is characterized by two *epicondyles* and the rounded articular *condyle* that articulates with the proximal (see Part 1 of this standard) ends of the *radius* and the *ulna* at the *elbow joint*.
40224	**radius**	The lateral (see Part 1 of this standard) of the two *forearm* bones. (plural: radii, adjective: radial.) NOTE 1 The proximal (see Part 1 of this standard) end (head) is rounded and articulates with the *humerus* at the *elbow joint* and with the *ulna*. The expanded distal (see Part 1 of this standard) end forms the base that articulates with the *carpal bones* at the *wrist joint* and with the head of the ulna. NOTE 2 Movement between the *radius* and the ulna is termed *pronation* and *supination*.
40225	**ulna**	The medial (see Part 1 of this standard) of the two *forearm* bones. (adjective: ulnar.) NOTE 1 The proximal (see Part 1 of this standard) end is characterized by the *trochlear* notch which articulates with the *humerus* at the *elbow joint* and the olecranon process (the point of the *elbow*). NOTE 2 The proximal end articulates with the *radius*, as does the distal end (see Part 1 of this standard) (head) which also is characterized by the prominent styloid process.

No.	Term	Definition
40226	**carpus**	The group of small bones of the *hand* articulating proximally with the distal (see Part 1 of this standard) end of the *radius*, distally with the *metacarpus* and comprising the scaphoid, lunate, triquetrum, trapezium, trapezoid, capitate, hamate and pisiform bones. (adjective: carpal.)
40227	**metacarpus**	The five bones lying between the *carpus bones* and the *digits*. (adjective: metacarpal.) NOTE The first metacarpal relates to the *thumb*, the second to the index *finger*, the third to the middle finger, the fourth to the ring finger and the fifth to the little finger.
40228	**os coxa** hip bone	That part of the *skeleton* (formerly called the os innominatum), comprising the ilium, the ischium and the pubis. NOTE 1 It is the main part of the *lower limb girdle*, articulating with the head of the *femur* at the *hip joint*, and with the *sacrum*. Anteriorly, the two os coxae articulate at the symphysis pubis. NOTE 2 In the child, the constituent bones are separated by the Y-shaped *epiphyseal* cartilage plate (see Part 1 of this standard) in the acetabulum (a cup-shaped depression forming part of the hip joint).
40229	**femur**	The *bone* of the *thigh*. NOTE The upper end bears the *trochanters* for muscle attachments and the neck carrying the head (ball of *hip joint*), articulating with the acetabulum or socket of the *lower limb girdle*. The lower end is extended into two *condyles*, articulating with the *patella* and the *tibia* at the *knee joint*.
40230	**calcar femorale**	a) In anatomy. The plate of *bone* formed by the condensation of trabeculae (see Part 1 of this standard) at the junction of the neck and *shaft* of the *femur* inferiorly and posteriorly (see Part 1 of this standard). b) In surgery. Commonly used to denote the very strong area at the root of the neck of the femur inferiorly (see Part 1 of this standard) at the junction with the shaft just above the lesser *trochanter*.
40231	**patella** knee cap	The *bone* of the *knee joint*, lying in the quadriceps tendon, having articular cartilage (see Part 1 of this standard) on its posterior surface which glides over the front of the articular surface of the lower end of the *femur*. (plural: patellae, adjective: patellar.)
40232	**tibia**	The major *bone* of the *shin*, extending from the *knee* to the *ankle*. (plural: tibiae, adjective: tibial.)
40233	**fibula** splint bone	The lesser *bone* of the *leg* proper, serving mainly for attachment of the *muscles*. The lower end forms the outer prominence of the *ankle joint*. (plural: fibulae, adjective: fibular.)
40234	tarsus	The group of small bones of the foot consisting of the *talus*, the *calcaneum*, the navicular, the cuboid and the three cuneiform *bones*. These bones form the *hindfoot*. (adjective: tarsal.)
40235	**talus**	The *tarsal bone* (formerly called the astragalus) lying between the lower end of the *tibia* and the remainder of the *foot*. (adjective: talar.)
40236	**calcaneum** calcanium; os calcis	The *tarsal bone* forming the heel, into which the *tendo Achillis* (Achilles tendon or the tendo-calcaneus) is inserted. (plural: calcanei, adjective: calcaneal.)
40237	**metatarsus**	The five *bones* lying between the *tarsus* and the *toes* and which form the *forefoot*. (adjective: metatarsal.)
40238	**phalanx**	A *bone of a digit*. There are two [proximal and distal (see Part 1 of this standard)] in the *thumb* and the great *toe* (hallux); there are three [proximal, medial and distal (see Part 1 of this standard)] in the other digits. (plural: phalanges, adjective: phalangeal.)

No.	Term	Definition
40239	**skull**	The *skeleton* of the head. The upper part forms a box [cranium (see Part 1 of this standard)] to protect the brain; the anterior and lower part underlies the face (see Part 1 of this standard) and the jaws.
40240	**maxilla**	One of the two paired *bones* of the upper jaw containing the upper teeth. (plural: maxillae, adjective: maxillary.)
40241	**mandible**	One of the two paired *bones* of the lower jaw containing the lower teeth and articulating with the *skull* at the *temporomandibular joint*. (adjective: mandibular.)

Section 403. Joints

40301	**joint** articulation	The junction of two or more *bones* of the *skeleton* together with the immediately adjacent soft tissues responsible for the integrity of the junction, i.e. the *synovium*, the *capsule* and the ligaments (see Part 1 of this standard) as appropriate. (adjective: articular.)
40302	**symphysis**	A *joint* between *bone* ends covered by hyaline cartilage (see Part 1 of this standard) with an intervening fibrous disc. (plural: symphyses, adjective: symphyseal.) NOTE All symphyses are in the median plane (see Part 1 of this standard), e.g. the symphysis pubis at the front of the *lower limb girdle* and the *intervertebral discs*. Little movement occurs at these *joints*.
40303	**synovial joint**	A *joint* between *bone* ends covered by hyaline articular cartilage (see Part 1 of this standard); the joint cavity around the bone ends is filled with synovial fluid and surrounded by the *capsule* lined by the *synovial membrane*. NOTE Usually a considerable range of movement is possible at synovial joints.
40304	**synovium** synovial membrane	The thin membrane lining a *synovial joint* (except over articular cartilage), *bursae* and parts of some tendons (see Part 1 of this standard). It secretes synovial fluid which serves as a lubricant and which is important in the nutrition of the articular cartilage.
40305	**capsule**	In anatomy. The fibrous sleeve of a *joint*. (adjective: capsular.) NOTE Contrast with the definitions given in Part 1 of this standard.
40306	**meniscus**	A disc or crescent of fibrocartilage (see Part 1 of this standard) between the surfaces of certain *joints*, e.g. the so-called "cartilage" in the *knee joint*. (plural: menisci, adjective: meniscal.)
40307	**bursa**	a) A sac lined by a *synovium*. It is found at places of friction or potential friction as a normal structure (anatomical bursa), or as an abnormal structure (adventitious bursa). b) A normal diverticulum of a *joint* (e.g. suprapatellar bursa). (plural: bursae, adjective: bursal.)
40308	**flexion**	Angular movement at a *joint* in a sagittal plane (see Part 1 of this standard). NOTE 1 Flexion at the *shoulder* is slightly oblique to the sagittal plane, the upper limb being carried forwards towards the median plane (see Part 1 of this standard). Flexion of the *thumb* is almost completely in the coronal plane (see Part 1 of this standard), the thumb being moved across the *palm*. Dorsi-flexion of the *foot* is an *extension* movement. Flexion of the *ankle* causes *plantar* flexion of the foot. NOTE 2 Figure 5 illustrates the direction of angular movement in flexion.

No.	Term	Definition
40309	**extension**	Angular movement at a *joint* in a sagittal plane (see Part 1 of this standard). NOTE 1 Extension at the *shoulder* is slightly oblique to the sagittal plane, the *arm* being carried backwards away from the median plane (see Part 1 of this standard). Extension of the *thumb* is almost in the coronal plane (see Part 1 of this standard), the thumb being carried away from the *hand*. Extension of the *foot* is called dorsi-flexion. Extension of the *ankle* causes dorsi-flexion of the foot. NOTE 2 Figure 6 illustrates the direction of angular movement in extension.
40310	**adduction**	Angular movement at a *joint* in a coronal plane (see Part 1 of this standard) towards the median plane (see Part 1 of this standard) of the body except that: a) in the *hand*, adduction refers to movement towards an axis through the middle finger and the third *metacarpal bone*; b) in the *foot*, adduction refers to movement towards an axis through the second *toe* and second *metatarsal bone*. NOTE 1 Adduction of the *thumb* carries the thumb towards the *palm*, almost in the sagittal plane (see Part 1 of this standard). NOTE 2 Contrast with *abduction*.
40311	**abduction**	Angular movement at a *joint* in a coronal plane (see Part 1 of this standard) away from the median plane (see Part 1 of this standard) of the body except that: a) in the *hand*, abduction refers to movement away from an axis through the middle finger and third *metacarpal bone*; b) in the *foot*, abduction refers to movement away from an axis through the second *toe* and second *metatarsal bone*. NOTE 1 In abduction of the *thumb*, the thumb is carried away from the *palm* in the sagittal plane (see Part 1 of this standard). NOTE 2 Contrast with *adduction*.
40312	**pronation**	Rotating the *forearm* inwards; e.g. with the *elbow* bent, the *palm* faces downwards. NOTE Contrast with *supination*.
40313	**supination**	Rotating the *forearm* outwards, e.g. with the *elbow* bent, the *palm* faces upwards. NOTE Contrast with *pronation*.
40314	**opposition**	The composite movement of the *thumb*, partly *abduction* and partly *rotation*, around the longitudinal axis so that the tip of the *thumb* may be brought to touch the tips of the *fingers*.
40315	**rotation**	The movement of a limb around the longitudinal axis. In external rotation, the anterior aspect of the limb turns to face laterally (see Part 1 of this standard); in internal rotation, the anterior (see Part 1 of this standard) aspect of the limb turns to face medially (see Part 1 of this standard).
40316	**circumduction**	The composite movement of *flexion*, *adduction*, *extension* and *abduction* as one circular movement. It is only possible at certain *joints*, e.g. the *shoulder* and the *hip joints*.
40317	**inversion**	The combined *adduction* and *plantar flexion* of the *foot* so that the *sole* tends to face the median plane (see Part 1 of this standard). NOTE Contrast with *eversion*.
40318	**eversion**	The combined *abduction* and dorsi-flexion of the *foot* so that the *sole* tends to face away from the median plane (see Part 1 of this standard). NOTE Contrast with *inversion*.
40319	**temporomandibular joint**	The *joint* between the *condyle* of the *mandible* (lower jaw) and the base of the *skull*.

No.	Term	Definition
40320	**atlanto-occipital joint**	The *joint* between the base of the *skull* and the first cervical *vertebra* (atlas vertebra).
40321	**atlanto-axial joint**	The *joint* between the first (atlas) and the second (axis) *cervical vertebrae.*
40322	**sternoclavicular joint**	The *joint* between the medial (see Part 1 of this standard) end of the *clavicle* and the *sternum*. NOTE Movement at this and the *acromioclavicular joint* allows considerable movements between the *upper limb girdle* and the chest wall thus increasing considerably the range of movement of the whole upper limb.
40323	**acromioclavicular joint**	The joint between the lateral (see Part 1 of this standard) end of the *clavicle* and the acromiom process of the *scapula.*
40324	**shoulder joint** gleno-humeral joint	The joint between the shallow glenoid cavity of the *scapula* and the convex head of the *humerus.* NOTE The *muscles* that *abduct* the shoulder joint (supraspinatus and *deltoid muscles*) have special surgical importance. Movements of the *upper limb girdle* involve the *shoulder*, the *acromioclavicular* and *sternoclavicular joints* and movement between the *scapula* and the chest wall.
40325	**elbow joint**	The *joint* between the distal (see Part 1 of this standard) end of the *humerus* (*bone* of the *arm* proper) and the proximal (see Part 1 of this standard) ends of the *radius* and the *ulna* (*bones* of the *forearm*). NOTE It is *extended* by the triceps *muscle* in the back of the *arm* and flexed by the brachialis and *biceps muscles*. The latter muscle also *supinates* the *forearm*.
40326	**radio-ulnar joints**	The superior and inferior (see Part 1 of this standard) *joints* at each end of the *radius* and the *ulna* allowing the *rotatory* movements of the *forearm* which are termed *pronation* and *supination*.
40327	**wrist joint**	The *joint* between the distal (see Part 1 of this standard) end of the *radius* and the proximal (see Part 1 of this standard) row of the *carpal* bones (scaphoid, lunate and triquetrum bones).
40328	**carpometacarpal joint**	The *joint* between the *carpal* and the *metacarpal bones*. NOTE The carpometacarpal joint of the *thumb* is adapted to allow a wide range of movement, particularly *opposition.*
40329	**metacarpophalangeal joint**	The *joint* between the *metacarpal* bone and the proximal *phalanx* of any *digit* of the *hand*.
40330	**interphalangeal joint**	The *joint* between the *phalanges* of the *digits.* In all *fingers* and in the second to fifth *toes* there are two interphalangeal joints: the proximal (see Part 1 of this standard) joint between the proximal and middle phalanges and the distal (see Part 1 of this standard) joint between the middle and distal phalanges.
40331	**sacro-iliac joint**	The *joint* between the *sacrum* and the iliac part of the *os coxa* (hip bone). NOTE Although a *synovial joint,* it has very little movement.
40332	**hip joint**	The ball-and-socket *joint* between the convex head of the *femur* and the concave acetabulum or socket in the *os coxa* (hip bone).
40333	**knee joint**	The *joint* between the *femur* and the *tibia,* including also the joints between the femur and the *patella* (knee cap).
40334	**ankle joint**	The *joint* between the *tibia,* the *fibula* and the *talus*.
40335	**subtalar joint**	The bipartite *joint* between the *talus* and *calcaneum* (formerly called the talo-calcaneal joint) that, in association with the talo-navicular joint, allows the movements of *inversion* and *eversion*.

No.	Term	Definition
40336	**midtarsal joint**	The *joint* between the *talus* and the *calcaneum* proximally (see Part 1 of this standard) and the navicular and cuboid *bones* distally (see Part 1 of this standard).
40337	**tarsometatarsal joint**	A complex *joint* between the cuneiform and cuboid *bones* proximally (see Part 1 of this standard) and the bases of the *metatarsal bones* distally (see Part 1 of this standard).
40338	**metatarsophalangeal joint**	The *joint* between the distal end (see Part 1 of this standard) (head) of the *metatarsal bone* and the proximal (see Part 1 of this standard) *phalanx* of the *toe*.

Section 404. Muscles and ligaments

40401	**muscle**	a) An aggregation of muscle fibres forming an anatomically recognizable entity. b) Any aggregation of muscle fibres.
40402	**muscle origin**	The attachment of one end of a *muscle* which is usually the proximal (see Part 1 of this standard) end in a limb. NOTE Contrast with *muscle insertion.*
40403	**muscle insertion**	One attachment of a *muscle* or the tendon of a muscle which is usually a distal (see Part 1 of this standard) attachment in a limb. NOTE Contrast with *muscle origin.*
40404	**contraction**	The activation of *muscle* tissue.
40405	**isometric contraction**	The contraction of a *muscle* without a change in length, resulting in an increase in tension in the muscle. NOTE Contrast with *isotonic contraction.*
40406	**isotonic contraction**	The contraction of a *muscle* without a change in tension within the muscle but with a shortening of the muscle. NOTE Contrast with *isometric contraction.*
40407	**deltoid muscle**	The *muscle* over the point of the *shoulder* originating from the *upper limb girdle*, inserted into the *humerus* and concerned with the *abduction* of the *shoulder joint*.
40408	**biceps muscle**	Commonly, the *muscle* (called the biceps brachii) forming a prominent bulge on the front of the upper *arm*. There is also a biceps muscle in the *thigh* (called the biceps femoris) which is one of the *hamstring muscles*.
40409	**thenar muscles**	The small *muscles* at the base of the *thumb* forming the thenar eminence of the *palm*
40410	**hypothenar muscles**	The *muscles* overlying the fifth *metacarpal bone* forming the hypothenar eminence of the *palm*.
40411	**intrinsic muscles**	The small *muscles* in the *hand* and the *foot* which help to control movements of the *digits;* they include the *thenar, hypothenar*, interosseous, lumbrical and some other *muscles*.
40412	**gluteus muscles**	The large *muscles* forming the bulk of the buttocks (see Part 1 of this standard) and responsible for the *abduction* and *extension* of the *hip joint.* (plural: glutei, adjective: gluteal.) NOTE They are most important in the maintenance of an upright posture during standing and locomotion (see Part 1 of this standard).
40413	**quadriceps femoris muscle**	The *muscle* of the front of the *thigh,* the *contraction* of which *extends* (straightens) the *knee*.

No.	Term	Definition
40414	**hamstring muscles**	The *muscles* of the back of the *thigh* that *flex* (bend) the *knee*.
40415	**calf muscles**	The *muscles* (formerly called the triceps surae) responsible for the bulk of the *calf*. *Contraction* depresses the front of the *foot* (as in tiptoeing) and is therefore important in walking, running and jumping. NOTE See also *tendo Achillis*.
40416	**tendo Achillis** tendo calcaneus; Achilles tendon	The large tendon inserted into the *calcaneum* (heel bone) and powered by the *calf muscles*.
40417	**patellar tendon** patellar ligament; ligamentum patellae	The structure that tethers the lower pole of the *patella* to the *tibia* thus acting as the tendon of the *quadriceps femoris muscle*.
40418	**ligamentum teres**	A rounded ligament-like structure containing an artery and which joins the head of the *femur* to the inferior part of the acetabulum of the *os coxa* (hip bone).
40419	**cruciate ligaments**	Two ligaments in the *knee joint*, joining the *femur* to the *tibia*. Called the anterior (see Part 1 of this standard) and posterior (see Part 1 of this standard) ligaments, they prevent gliding of the tibia on the femur.

Section 405. Pathology

40501	**rarefaction**	A term that indicates the reduced density of bone when visualized in radiographs.
40502	**osteoporosis**	The thinning of the mineralized components of a *bone* with or without reduction of the number of trabeculae (see Part 1 of this standard). NOTE This may affect part of, or the whole of, a *bone* or the *skeleton*.
40503	**osteomalacia**	The histological (see Part 1 of this standard) appearance characteristic of lack of vitamin D, i.e. the loss of calcium salts from *bone* with an increase in unmineralized tissue (*osteoid*).
40504	**osteoid**	Unmineralized new *bone* tissue, mainly collagen fibre (see Part 1 of this standard) and osteocytes.
40505	**sclerosis**	Of bone. A term that indicates the increased density of *bone* when visualized in radiographs. (adjective: sclerotic.)
40506	**dysplasia**	The abnormal development of *bone* during growth.
40507	**fracture**	A break in a *bone*.
40508	**traumatic fracture**	A *fracture* due to violence.
40509	**green stick fracture**	An incomplete *traumatic fracture* of an immature *bone*.
40510	**infraction**	A *traumatic fracture* of part of the circumference of a *bone*.
40511	**avulsion fracture**	A *fracture* that results in a fragment of *bone* being pulled off by soft tissues [e.g. a ligament (see Part 1 of this standard) or a *muscle*].
40512	**fatigue fracture** stress fracture, *deprecated*	Of bone. A *fracture,* often incomplete, resulting from an unaccustomed pattern of activity.

No.	Term	Definition
40513	**pathological fracture**	A *fracture* of diseased (see Part 1 of this standard) *bone,* e.g. bone eroded by a tumour (see Part 1 of this standard) or bone rendered fragile by disuse or constitutional disease such as osteogenesis imperfecta, *osteitis deformans* (Paget's disease), *osteoporosis* or *osteomalacia*. NOTE Pathological fractures associated with constitutional disease are often referred to as pseudofracture, insufficiency fracture, transformation zone or Looser's zone.
40514	**open fracture** compound fracture, *deprecated*	A *fracture* in continuity with an external wound (see Part 1 of this standard) or an air-containing body cavity, e.g. a nasal sinus (see Part 1 of this standard).
40515	**closed fracture** simple fracture, *deprecated*	A *fracture* without an overlying wound (see Part 1 of this standard) in continuity.
40516	**undisplaced fracture**	A *fracture* with no shift of *bone* fragments on each side of the fracture line.
40517	**displaced fracture**	A *fracture* in which there is a shift of *bone* fragments at the fracture site.
40518	**complicated fracture**	A *fracture* with an injury to an adjacent important structure, e.g. a major nerve or artery.
40519	**union**	Of a fracture. A stage in the healing of a *fracture* when there is no longer clinically detectable movement at, nor pain on stressing, the fracture site.
40520	**delayed union**	Of a fracture. The failure of a *fracture* to unite within the usually acceptable time for that particular fracture, and in which the cortex (see Part 1 of this standard) has not grown across the *bone* ends. NOTE With prolongation of efficient conservative treatment, *union* usually occurs.
40521	**non-union**	Of a fracture. The established failure of *union* of a *fracture.* Union cannot be expected without an operation. There are two types: a) Atrophic, in which the cortex (see Part 1 of this standard) extends across the *fracture* surfaces, creating separate *bones* with a persistent gap. b) Hypertrophic, in which the ends of the bones at the fracture become expanded (elephant's foot) and remain *sclerotic* with a persistent gap between the bone ends. NOTE The gap is termed a pseudarthrosis.
40522	**malunion**	Of a fracture. *Union* at a *fracture* with displacement of the *bone* ends from the normal anatomical position.
40523	**callus**	Repair tissue that develops around the fractured ends of a *bone*. NOTE Callus present before *union* occurs may be called provisional callus. *Bone* formation in the callus is initially poorly organized (woven bone) but, following union, remodelling occurs to form cortical or cancellous (see Part 1 of this standard) bone as appropriate.
40524	**consolidation**	Of a fracture. A stage in the healing of a fracture when the fracture *callus* has been converted into normal *bone.* The fractured bone can now assume its normal function.

No.	Term	Definition
40525	**stable**	Of fractures and joints. (adjective.) A state of a fracture or of a joint in which displacement or *dislocation* respectively is unlikely before healing occurs, assuming that adequate *fixation* is maintained. (noun: stability.)
40526	**periostitis**	Inflammation (see Part 1 of this standard) of the *periosteum*.
40527	**periosteal reaction**	The appearance of new *bone* formation under the *periosteum* usually resulting from the stripping up of the periosteum from the bone.
40528	**osteomyelitis**	An infection of *bone;* it is usually acute but can be chronic. (adjective: osteomyelitic.)
40529	**osteitis deformans** Pagets disease	Benign (see Part 1 of this standard), often painful reactive process occurring in *bone,* particularly in older age, and characterized by the thickening and irregularity of bone trabeculae (see Part 1 of this standard).
40530	**exostosis**	A projection from a *bone* due to minor aberration during growth. NOTE It commonly occurs as a solitary exostosis, but in an inherited disease (diaphyseal aclasis), multiple exostoses occur.
40531	**osteosarcoma**	A malignant tumour (see Part 1 of this standard) of *bone;* the cells (see Part 1 of this standard) of the tumour are predominantly bone-producing cells. NOTE Contrast with *chondrosarcoma* and *fibrosarcoma.*
40532	**chondrosarcoma**	A malignant tumour (see Part 1 of this standard) of *bone.* The cells of the tumour tend to form cartilage (see Part 1 of this standard). NOTE Contrast with *osteosarcoma* and *fibrosarcoma.*
40533	**giant cell tumour** osteoclastoma	A tumour (see Part 1 of this standard) of *bone* consisting of giant cells (see Part 1 of this standard) with a background of spindle or oval cells, occurring at the ends of a skeletally mature bone. The tumour may be benign (see Part 1 of this standard), but commonly recurs after removal and may become malignant (see Part 1 of this standard).
40534	**giant cell variants**	Tumours and cysts, all benign (see Part 1 of this standard), occurring in bone, that contain giant cells (see Part 1 of this standard) and the histological appearance of which may be confused with that of a *giant cell tumour.*
40535	**monostotic**	(adjective). A term that indicates affection of one *bone* only. NOTE Contrast with *polyostotic* and compare with *monarthritis.*
40536	**polyostotic**	(adjective). A term that indicates affection of many *bones.* NOTE Contrast with *monostotic* and compare with *polyarthritic.*
40537	**apophysitis**	The inflammation of an *apophysis,* usually resulting from excessive muscle stress on the apophysis.
40538	**osteochondritis**	The affection of a *bone* and the overlying articular cartilage (see Part 1 of this standard), commonly due to damage to the blood supply of the affected bone. NOTE It usually occurs in adolescents and young adults.
40539	**avascular necrosis**	The death of a *bone* due to the interruption of the blood supply.
40540	**spondylolysis**	A break in the posterior arch of a *vertebra.*

No.	Term	Definition
40541	**spondylolisthesis**	A condition in which the body of a *vertebra* slips forward on the body of the vertebra below. NOTE It may result from *spondylolysis*.
40542	**spondylosis**	Changes in the *spine* due to degenerative changes in the *intervertebral discs*; it is characterized by a narrowing of the disc space, *osteophyte* formation and *sclerosis* of the *bone* adjacent to the disc space.
40543	**synovitis**	Inflammation (see Part 1 of this standard) of the *synovial membrane*.
40544	**synovial effusion**	The collection of fluid within a *joint,* secreted by the *synovium* in response to injury, inflammation (see Part 1 of this standard), etc.
40545	**arthrosis**	A non-infective disease (see Part 1 of this standard) of a *joint*.
40546	**haemarthrosis**	Blood within a *joint* cavity due to a haemorrhage (usually following an injury) (see Part 1 of this standard).
40547	**pyoarthrosis**	The presence of pus (see Part 1 of this standard) within a joint cavity arising from an infection (see Part 1 of this standard) outside the *joint* and before the joint tissues become infected. NOTE Compare with *septic arthritis*.
40548	**osteoarthritis** osteoarthrosis	Degenerative changes occurring in a *joint,* characterized by pain, swelling, stiffness, loss of articular cartilage (see Part 1 of this standard), *bone sclerosis* and *osteophyte* formation. (adjective: osteoarthritic.)
40549	**chondromalacia**	The softening of articular cartilage (see Part 1 of this standard); it is the first stage of *osteoarthritis*.
40550	**arthritis**	Inflammation (see Part 1 of this standard) of a *joint*. The term is loosely used to indicate any joint pathology. (adjective: arthritic.)
40551	**septic arthritis** pyoarthritis	Inflammation (see Part 1 of this standard) of a *joint* due to infection. NOTE This implies an active *synovitis* with pus (see Part 1 of this standard) in a joint. NOTE Contrast with *pyoarthrosis*.
40552	**rheumatoid arthritis**	*Arthritis* associated with rheumatoid disease characterized by effusion, *synovitis,* bone erosion and pannus (see Part 1 of this standard) formation.
40553	**monarthritis**	*Arthritis* affecting only one *joint*. (adjective: monarthritic.) NOTE Contrast with *polyarthritis*.
40554	**polyarthritis**	*Arthritis* affecting many *joints*. (adjective: polyarthritic.) NOTE Contrast with *monarthritis*.
40555	**osteophyte**	New *bone* formation at the margin of articular cartilage (see Part 1 of this standard) occurring in *osteoarthritis* or resulting from the stripping up of soft tissues at the margin of the *joint*.
40556	**dislocation**	Of a joint. The complete loss of congruent *articulation* of the *bones* forming a *joint,* in association with abnormality of, or damage to, the *joint capsule*.
40557	**congenital dislocation**	*Dislocation* present before or at the time of birth.
40558	**traumatic dislocation**	*Dislocation* due to injury.

No.	Term	Definition
40559	**pathological dislocation**	*Dislocation* of a *joint* due to disease affecting the tissues comprising the joint or paralysis of the *muscles* controlling the joint.
40560	**subluxation**	Incomplete *dislocation* that usually results in some loss of function of the affected *joint*.
40561	**recurrent dislocation**	Repeated *dislocation* resulting from loading that usually would be insufficient to *dislocate* a normal *joint*.
40562	**habitual dislocation**	*Dislocation* of a *joint* that occurs whenever the joint is used, e.g. lateral dislocation of the *patella* on bending the *knee*.
40563	**ankylosis**	The stiffening of a *joint* due to damage to the joint surfaces by disease or injury. Ankylosis may be fibrous or bony. NOTE Compare with *arthrodesis*.
40564	**ganglion** synovial ganglion	A benign cyst (see Part 1 of this standard) derived from the synovium of a *joint* or tendon sheath.
40565	**synovioma**	A malignant tumour (see Part 1 of this standard) derived from synovial tissue.
40566	**myopathy**	Any disease of the *muscle* tissues.
40567	**myositis**	Inflammation (see Part 1 of this standard) of a *muscle*.
40568	**post-traumatic myositis ossificans**	Formation of *bone* within a *muscle* or tendon following injury to the muscle often close to the bone. It commonly occurs at the *elbow,* in the *quadriceps femoris muscles* and in the origin of the *hamstring muscles*.
40569	**tenosynovitis**	Inflammation (see Part 1 of this standard) of the *synovium* of a tendon sheath.
40570	**bursitis**	Inflammation (see Part 1 of this standard) of a *bursa*.
40571	**fasciitis**	Literally, inflammation of the fascia (see Part 1 of this standard), but usually used more loosely to indicate any affection of the fascia, e.g. plantar fasciitis.
40572	**fibromatosis**	Locally aggressive proliferation of fibrous tissue cells (see Part 1 of this standard) prone to recur after excision (see Part 1 of this standard), e.g. Dupuytren's contracture of the palmar fascia.
40573	**fibrosarcoma**	A malignant tumour (see Part 1 of this standard) derived from fibrous tissue. NOTE Contrast with ***osteosarcoma*** and ***chondrosarcoma***.
40574	**muscle spasm**	An involuntarily sustained *contraction* of a *muscle,* usually painful.
40575	**cramp**	A painful *muscle spasm* often associated with fatigue or upset body chemistry.

Section 406. Deformities

No.	Term	Definition
40601	**deformity**	An abnormality of a part of the body in relationship to the whole, resulting from angulation, displacement or *rotation* of that part of the body in respect of the whole, or as a result of an increase or decrease in the size of a part in relation to the whole body. The deformity may be *postural* or *fixed*. NOTE Usually only *fixed deformities* present clinical problems. When describing a deformity, the displacement of the distal (see Part 1 of this standard) part in relation to the proximal (see Part 1 of this standard) part is usually indicated, even though the displacement may have occurred in the proximal part.
40602	**postural deformity**	A *deformity* that changes as the result of alterations in the attitude or position of the body.
40603	**fixed deformity**	A *deformity* that remains unaltered irrespective of the attitude or position of the body.
40604	**valgus** (m.)[a] **valga** (f.) **valgum** (n.)	a) A *deformity* or displacement in which the axis of the distal (see Part 1 of this standard) segment deviates away from the mid-line in relation to the proximal (see Part 1 of this standard) segment. NOTE 1 See Figure 3 and Figure 4. NOTE 2 If the deviation is within the length of the *bone,* the direction of the deviation is preceded by the name of the bone, e.g. tibia valga, when the distal part of the *tibia* is deviated away from the mid-line at a point within the *shaft* of the bone. If the deformity is at or close to a *joint,* the joint may be qualified by the term, indicating that the limb distal to the joint is deviated away from the mid-line, e.g. cubitus valgus, when the *forearm* is in valgus in relation to the upper *arm* due to a deformity of the lower *humerus,* or genu valgum, when the *leg* below the *knee* deviates away from the mid-line as a result of a deformity at the knee, or in the *condyles* of the *femur* or tibia. It does not indicate that the joint is deviated away from the mid-line. At the *hip,* valgus deformity is related to the base of the neck of the femur (the angle between the upper part of the femur and the shaft is widened). Customarily, but incorrectly, this is described as coxa valga. b) Valgus also applies to *osteotomies* or prostheses (see Part 1 of this standard) designed to produce valgus deviation or correct *varus* deformity. NOTE In relation to prostheses, valgus should not be used to indicate the angle at which, at operation, the stem of the prosthesis is inserted in relation to the axis of the shaft of the bone but should only be used to indicate the anatomical position consequently produced in relation to the associated joint. If the stem of the prosthesis is not placed axially in the shaft of the bone its position should be described as being *adducted* or *abducted* relative to the axis of that bone.

[a] The gender of the term is dependent on the gender of the Latin term with which it is associated, e.g. cubitus valgus, tibia valga and genu valgum.

No.	Term	Definition
40605	**varus** (m.)[a] **vara** (f.) **varum** (n.)	a) A *deformity* or displacement in which the axis of the distal (see Part 1 of this standard) segment deviates towards the mid-line in relation to the proximal (see Part 1 of this standard) segment. NOTE 1 See Figure 3 and Figure 4. NOTE 2 If the deviation is within the length of the *bone,* the direction of the deviation is preceded by the name of the bone, e.g. tibia vara, when the distal part of the *tibia* is deviated towards the mid-line at a point within the *shaft* of the bone. If the deformity is at or close to a *joint,* the joint may be qualified by the term, indicating that the limb distal to the joint is deviated towards the mid-line, e.g. cubitus varus, when the *forearm* is in varus in relation to the upper *arm* due to a deformity of the lower *humerus,* or genu varum, when the *leg* below the *knee* deviates towards the mid-line as a result of a deformity at the knee, or in the *condyles* of the *femur* or tibia. It does not indicate that the joint is deviated towards the mid-line. At the *hip,* varus deformity is related to the base of the neck of the femur (the angle between the upper part of the femur and the shaft is narrowed). Customarily, but incorrectly, this is described as coxa vara. b) Varus also applies to *osteotomies* or prostheses (see Part 1 of this standard) designed to produce varus deviation or correct valgus deformity. NOTE In relation to prostheses, varus should not be used to indicate the angle at which, at operation, the stem of the prosthesis is inserted in relation to the axis of the shaft of the bone but should only be used to indicate the anatomical position consequently produced in relation to the associated joint. If the stem of the prosthesis is not placed axially in the shaft of the bone its position should be described as being *adducted* or *abducted* relative to the axis of that bone.
40606	**adduction deformity**	A *deformity* in which the limb distal (see Part 1 of this standard) to a damaged *joint* or *bone* is angled towards the medial plane (see Part 1 of this standard). In the *thumb,* angulation is towards the plane of the *palm*. NOTE Contrast with *abduction deformity* and compare with *adduction*.
40607	**abduction deformity**	A *deformity* in which the limb distal (see Part 1 of this standard) to an affected *joint* or *bone* is angled away from the medial plane (see Part 1 of this standard). In the *thumb,* angulation is away from the plane of the *palm*. NOTE Contrast with *adduction deformity* and compare with *abduction*.
40608	**fixed joint deformity**	A *deformity* at a *joint* in which the range of movement in one or more planes is limited and which cannot be corrected either actively or passively. NOTE Compare with *ankylosis*.
40609	**fixed flexion deformity**	A *fixed deformity* in which a *joint* is held *flexed* and cannot be brought to the neutral position or mid-position.
40610	**fixed adduction**	A *fixed deformity* in which a *joint* is held in the *adducted* position and cannot be brought to the neutral position or mid-position.
40611	**fixed abduction**	A *fixed deformity* in which a *joint* is held in the *abducted* position and cannot be brought to the neutral position or mid-position.
40612	**fixed internal rotation**	A *fixed deformity* in which a *joint* is held in internal *rotation* and cannot be externally rotated to reach the mid-position of movement.
40613	**fixed external rotation**	A *fixed deformity* in which a *joint* is held in external *rotation* and cannot be internally rotated to reach the mid-position of movement.

[a] The gender of the term is dependent on the gender of the Latin term with which it is associated, e.g. cubitus varus, tibia vara and genu varum.

No.	Term	Definition
40614	**fixed plantar flexion deformity** equinus	A *fixed deformity* of the *foot,* in which it is *flexed* in the *plantar* direction.
40615	**calcaneus deformity**	The term applied to a *fixed* dorsi-*flexion deformity* of the *foot* in which the whole of, or the hind part of, the foot is affected (so called because the weight is now borne on the *heel*). NOTE See *calcaneum*.
40616	**joint laxity**	The condition of a *joint* in which the ligaments and the *capsule* are looser than normal, allowing excessive or abnormal movement to occur at the joint.
40617	**hyperflexion**	A position of *flexion* or a range of flexion movement of a *joint* greater than normally expected.
40618	**hyperextension**	A position of *extension* or a range of extension movement of a *joint* greater than normally expected.
40619	**contracture**	The pathological (see Part 1 of this standard) shortening of soft tissues in the region of a *joint* resulting in a restriction of the range of movement of the joint.
40620	**pes cavus**	A *deformity* of the *foot* due to the dropping of the *forefoot* resulting in a high arch at the *instep;* it is usually associated with *claw toes*.
40621	**pes arcuatus**	A deformity of the *foot* in which there is an exaggerated longitudinal arch that is bilateral, usually developmental and often familial. The *toes* are not involved as a part of this *deformity*.
40622	**pes planus** flat foot	A *deformity* of the *foot* due to the collapse of the longitudinal arch on the inner border of the foot.
40623	**claw toes**	A *deformity* of the *toes* in which the *interphalangeal joints* are *flexed* and the *metatarsophalangeal joints* are *hyperextended*.
40624	**hammer deformity**	A *fixed flexion deformity* of the proximal or distal (see Part 1 of this standard) or both *interphalangeal joints* of the *toe*.
40625	**mallet deformity**	A *flexion deformity* of the distal (see Part 1 of this standard) *interphalangeal joint* of the *thumb, finger* or *toe*.
40626	**swan neck deformity**	A composite *deformity* of the *finger* comprising *hyperextension* of the proximal (see Part 1 of this standard) *interphalangeal joint* and *flexion* of the distal (see Part 1 of this standard) interphalangeal joint.
40627	**boutonnierre deformity** buttonhole deformity	A *deformity* of the *finger* comprising *fixed flexion deformity* of the proximal (see Part 1 of this standard) *interphalangeal joint* and *hyperextension* of the distal (see Part 1 of this standard) interphalangeal joint.

Section 407. Surgical procedures

No.	Term	Definition
40701	**reduction**	a) Of a fracture. The act of restoring the normal relationship between the fragments of a *fractured bone*. b) Of a joint. The act of restoring congruous *articulation* of a *dislocated* or *subluxed joint*.
40702	**fixation** immobilization	Of fractures. The action of holding a *fracture* or *joint* in the *reduced* position. NOTE 1 External fixation is achieved by applying splints to the affected limb; internal fixation is achieved by applying plates and screws, *intramedullary nails*, bone grafts, etc. NOTE 2 For the fixation of implants see Part 1 of this standard.
40703	**osteosynthesis**	The *fixation* of *fracture* fragments of a bone by means of implants.
40704	**osteotomy**	The cutting of *bone* with surgical instruments. NOTE This may be used to correct *bone* or *joint deformities* or to relieve pain in *osteoarthritic* joints.
40705	**adduction osteotomy**	An *osteotomy* performed to angulate a *bone* so that the limb distal (see Part 1 of this standard) to the osteotomy is *adducted* compared with its original position.
40706	**abduction osteotomy**	An *osteotomy* performed to angulate a *bone* so that the limb distal (see Part 1 of this standard) to the osteotomy is *abducted* compared with its original position.
40707	**osteoclasis**	The therapeutic *fracture* of a *bone* to correct a *deformity*. NOTE Contrast with cellular erosion of bone by osteoclasts (see Part 1 of this standard).
40708	**osteotomy-osteoclasis**	The partial cutting of a *bone* followed by the breaking of the remainder. NOTE This procedure is used if angulation alone is to be corrected or produced.
40709	**laminectomy**	The excision (see Part 1 of this standard) of the posterior part (laminae and spinous process) of the arch of the *vertebra*. NOTE Hemilaminectomy is the excision of a lamina on one side only.
40710	**intervertebral discectomy**	The excision (see Part 1 of this standard) of an intervertebral disc. NOTE In the cervical region of the *vertebral column* this is achieved usually through the anterior approach. In the lumbar region of the vertebral column, the posterior approach is usually employed; *laminectomy* or hemilaminectomy may be used to facilitate the excision.
40711	**arthroscopy**	The inspection of the interior of a *joint* through a special instrument called an arthroscope.
40712	**arthrotomy**	The incision (see Part 1 of this standard) of a *joint*.
40713	**capsulotomy**	The division of the *capsule* of a *joint*.
40714	**capsulectomy**	The excision (see Part 1 of this standard) of the *capsule* of a *joint*.
40715	**synovectomy**	The excision (see Part 1 of this standard) of the *synovial membrane* from a *joint* or tendon.
40716	**meniscectomy**	The excision (see Part 1 of this standard) of a *meniscus* (usually from the *knee*).

No.	Term	Definition
40717	**arthroplasty**	The refashioning of a *joint* to improve the joint function by reshaping, with or without the excision (see Part 1 of this standard) of *bone* or the interposition of natural or artificial materials.
40718	**joint replacement**	The replacement of part (partial joint replacement) or the whole (total joint replacement) of a *joint* by an endoprosthesis (see Part 1 of this standard).
40719	**arthrodesis** joint fusion	An operation (see Part 1 of this standard) to stiffen permanently a *joint* in the best functional position. NOTE Compare with *ankylosis*.
40720	**disarticulation**	An amputation (see Part 1 of this standard) through a *joint*.
40721	**tenotomy**	The division (see Part 1 of this standard) of a tendon (see Part 1 of this standard), often as part of an operation (see Part 1 of this standard) to increase or decrease its length.
40722	**tenolysis**	The freeing of a tendon (see Part 1 of this standard) from the surrounding tissues.
40723	**tenodesis**	The fixation of a tendon (see Part 1 of this standard) to a *bone,* usually using the tendon to act as a ligament (see Part 1 of this standard).
40724	**tendon transfer**	The transfer of the insertion of a tendon (see Part 1 of this standard) to another site to alter the point of action of the associated *muscle.* NOTE Contrast with *tendon transplantation*.
40725	**tendon transplantation** tendon graft	The transfer of a tendon graft (see Part 1 of this standard) to replace a damaged tendon. NOTE The use of this term as a synonym for *tendon transfer* is deprecated.
40726	**fasciotomy**	The division of a fascia (see Part 1 of this standard).
40727	**fasciectomy**	The excision of a fascia (see Part 1 of this standard).
40728	**neurectomy**	The excision of a nerve (see Part 1 of this standard).
40729	**neurolysis**	The freeing of a nerve from the surrounding tissues (see Part 1 of this standard).

Section 408. Surgical instruments

40801	**osteotome**	A type of chisel with a cutting edge ground from both main surfaces, used for cutting *bone*.
40802	**tenotorne**	A knife with a small blade designed originally for dividing tendons (see Part 1 of this standard) subcutaneously through a small skin puncture instead of through a more extensive incision.
40803	**meniscotome**	A type of fixed-bladed knife of divers designs used during *meniscectomy*.
40804	**periosteal elevator** rugine	An instrument with a flat or curved blade used to strip soft tissues (see Part 1 of this standard) from *bone*.
40805	**file**	A tool for removing material by abrasion or by the cutting action of fine ridges.
40806	**rasp**	A coarse *file* with teeth in the form of raised points used to smooth *bone* edges. NOTE Specially shaped rasps are used to enlarge holes in the medulla (see the definition of "cortical bone" in Part 1 of this standard) of *bones* to accept stemmed internal prostheses.

No.	Term	Definition
40807	**drill**	A rotary bit used to bore holes.
40808	**reamer**	A rotary cutting tool used to enlarge or impart accuracy to parallel or tapered holes.
40809	**broach**	A cutting tool for making holes and consisting of a shaft carrying transverse cutting edges. The tool is driven or pulled through a roughly finished hole.
40810	**burr**	A small rotary *file* or *rasp* of divers profiles.
40811	**awl**	A pointed instrument for making holes in *bone,* often with an eye near the tip through which a suture (see Part 1 of this standard) material can be threaded. It is hand-powered.
40812	**tap**	An instrument used to cut a *screw thread* in a drilled hole before inserting a *non-self-tapping screw*.
40813	**lever**	A flattened instrument passed round a *bone* and used to retract soft tissues (see Part 1 of this standard) away from it.
40814	**mallet**	Any form of hammer used in orthopaedic surgery.
40815	**punch**	A blunt rod for conducting the driving force of a *mallet.* A bone punch has a flattened end. NOTE In operative surgery, a punch is not a piercing tool.
40816	**bone-cutting forceps**	A type of forceps with straight or slightly curved sharp edges for cutting *bone*.
40817	**bone-nibbling forceps** bone rongeur	A type of forceps for biting into the edge of bone, e.g. gouge and punch forceps.
40818	**bone-holding forceps**	A type of forceps designed to grip *bone*.
40819	**amputation saw**	A tenon-type saw, usually with a hinged stiffener along the back edge.
40820	**hacksaw**	A saw with a narrow detachable blade in a bow-shaped holder.
40821	**wire saw**	A flexible saw passed sub-*periosteally* behind a *bone* to divide it by a side-to-side motion (e.g. Gigli saw). NOTE If threaded extraduraly through *burr* holes, it can be used for resecting cranial bone.
40822	**goniometer**	An instrument used for measuring angular *deformity* or motion at *joints*.

Section 409. Fastening systems and devices for implants

40901	**fastener**	Any device used to attach an implant to a *bone* or another implant. It may also be used on its own to fix bone fragments together.
40902	**compression implant**	An implant adapted to obtain fixation by compressing *bone* fragments together.
40903	**wire**	A metal product of uniform cross section produced by a drawing process. NOTE Hard-drawn resilient wire, usually up to 2.5 mm diameter, and softened malleable wire of up to 1.2 mm diameter are commonly used in orthopaedic surgery.
40904	**wire suture**	A malleable strand of monofilament or braided *wire* up to 1.2 mm diameter. NOTE See BS 4106.

No.	Term	Definition
40905	**guide** guide wire	A *wire,* usually 2.5 mm diameter, used to direct the placing of a an implant. It may be etched with graduation marks. NOTE See BS 3531-6.
40906	**transfixion wire**	A rigid *wire* up to 2 mm diameter, used for the fixation of *bone* fragments and *fractures* of smaller bones or *arthrodesis* of small *joints.* Usually it is supplied with a three-sided shank and a diamond point.
40907	**traction wire**	A *wire* of high tensile strength (see Part 2 of this standard) used for the application of *skeletal* traction (e.g. Kirschner wire). NOTE 1 The traction *wire* may be held taut by a distraction stirrup. NOTE 2 See BS 3531-6.
40908	**pin**	A relatively rigid hard-drawn *wire* usually of 2.0 mm to 6.0 mm diameter, used for *skeletal traction pins*, *transfixion pins* and other rigid *wire* fixation devices. NOTE See BS 3531-6.
40909	**traction pin**	A *pin* used for the application of *skeletal* traction. It is usually 2.5 mm to 6.0 mm diameter and between 200 mm and 250 mm in length, with a trochar or a diamond point at one end and a three-sided shank at the other end (e.g. Steinmann pin). NOTE See BS 3531-6.
40910	**transfixion pin**	A *pin* of over 2.0 mm diameter used to secure fragments of *bone,* e.g. for *fractures* of the neck of the *femur* or to secure the *epiphysis* of the upper end of the femur. A part of the shaft may be *screw threaded*.
40911	**spinal rod**	Any rod used to stabilize the *vertebral column*, e.g. Harrington's rods used in the treatment of scoliosis.
40912	**staple**	A metal implant, usually of U form, adapted for driving into *bone.* It is forged or cast (see Part 3 of this standard) for strength. NOTE See Figure 7 for designs commonly used in orthopaedic surgery; see also BS 3531-11.
40913	**bone screw**	A screw devised for use in *bone.* It may be: a) machined from rod; b) cast; c) machined from cast blanks. NOTE See Figure 8 for an illustration of the parts of the screw; see also BS 3531-5.
40914	**head**	The expanded end of a *screw* including the *head recess* for a screwdriver and the *head countersink* if present.
40915	**head recess**	The aperture into which a screwdriver fits to provide the turning movement during the insertion of a *screw.* The recess may be a single slot, crossed slots, or a recessed shape, e.g. hexagonal.
40916	**land**	The surface of the cylindrical portion between the rounded top of the *head* and the *head countersink*.
40917	**head countersink**	The pressure face beneath the *head* of a *screw*. This may be spherical, conical or flat.

No.	Term	Definition
40918	**variable fitting screws**	*Screws* in which the diameter of the *head* varies with the diameter of the screw *thread*.
40919	**constant fitting screws**	*Screws* in which the diameter of the *head* is constant, and does not vary with the diameter of the *screw thread*.
40920	**shank**	The unthreaded portion of a *screw* between the *thread run-out* and the *countersunk* portion of *head*.
40921	**thread run-out**	The end of the thread beneath the *head* of the *screw*.
40922	**screw thread**	The ridge in the form of a helix on the external surface of the cylindrical portion of a *screw*. NOTE See Figure 9 for helix types used in orthopaedic surgery.
40923	**HA thread**	A shallow asymmetrical thread form. NOTE See Figure 9.
40924	**HB thread**	A deep asymmetrical thread form. NOTE See Figure 9.
40925	**HC thread**	A symmetrical thread form. NOTE See Figure 9.
40926	**screw point**	The end of a *screw,* usually blunt, driven into *bone*.
40927	**self-tapping flute**	A groove machined into the leading edge of a *screw* intersecting several threads to provide a cutting edge that enables the screw to cut its own thread in a drilled hole in a *bone*.
40928	**self-tapping screw**	A *screw* with self-tapping flutes on its *point*.
40929	**non-self-tapping screw**	A *screw* without *self-tapping flutes*.
40930	**bolt**	A fully or partially externally threaded rod with either a hexagonal *head* with or without a cross slot, or a round domed head with a cross slot.
40931	**self-locking bolt**	A *bolt* incorporating a nylon insert fitted flush with the crest of the thread.
40932	**nut**	A shaped metal collar, usually hexagonal, with an internal *screw thread* to mate with an externally threaded device.
40933	**self-locking nut**	A *nut* incorporating a device to prevent loosening.
40934	**plain washer**	An annular device used to protect the *bone* surface under a *nut* or *screw head* by distributing pressure.
40935	**locking washer**	A washer designed to prevent a *nut* or *bolt* from turning. In surgery, it is either hexagonal with four ridges or oblong with two narrow sides bent at an angle of 90°.
40936	**hip nail** upper femoral fixation nail, *deprecated*	A finned nail, nowadays cannulated, with a head that may be plain or adapted for fixation with a corresponding trochanteric plate.
40937	**self-adjusting nail**	An implant used for the fixation of upper femoral fractures, consisting of a nail which is freely telescopic within a barrel plate.
40938	**medullary nail** intramedullary nail	An implant for introduction into the marrow cavity of long *bones* forming an internal splint. The nail may be straight or curved and of V-, clover-leaf (e.g. Kuntscher nail) or circular cross section.

Section 410. Bone plates, nail plates and blade plates

No.	Term	Definition
41001	**bone plate**	A strip of material, usually metal, of divers sizes perforated by a number of holes. It is used in conjunction with *screws* or other *fasteners* to join fragments of *bone*. NOTE See BS 3531-5.
41002	**self-compressing plate**	A *bone plate* designed to exert a longitudinal compression force across a *fracture* line or *osteotomy* when the *screws* are fully tightened onto the plate.
41003	**nail plate**	A *bone plate* continuing into a formed section, which is lodged within the *bone*. Usually the formed part is at an angle to the plate.
41004	**blade plate** spline, *deprecated*	A *bone plate* continuing into a flat section which is lodged within the *bone*.
41005	**spinal plate**	A curved or straight plate usually used in pairs to hold two or more *vertebrae* together and applied posteriorly (see Part 1 of this standard) using *bolts* and *nuts*.

Section 411. Joint prostheses

41101	**partial joint prosthesis**	An implant that is a substitute for one, part of one, or part of both articular surfaces of a *joint*. NOTE Fixation of a component to the *bone* may be achieved by the use of grouting material (e.g. acrylic cement (see Part 3 of this standard and BS 3531-7), by ingrowth of bone into slots or porous surfaces, or by *fasteners*.
41102	**total joint prosthesis**	An implant that is a substitute for all the load transmitting (but not necessarily all the articular) surfaces of a *joint,* except for total joint replacement at the *knee* and *elbow,* when the patello-femoral and radio-humeral joints respectively, may not be replaced. NOTE See BS 3531-9.
41103	**fully constrained joint prosthesis**	A *joint prothesis* in which the main components are linked in such a way that the bearing surfaces remain in contact throughout the range of movement of the *joint* in the unloaded state.
41104	**partially constrained joint prothesis**	A *joint prosthesis* in which the main components are linked in such a way that in the unloaded state separation of the components may occur during some or all of the available range of movement.
41105	**un-constrained joint prothesis**	A *joint prosthesis* in which there is no mechanical linkage between its main components. NOTE 1 The functional stability in the body depends on the shape of the components and the restraint of the surrounding body tissues. NOTE 2 For classification, designation of components and dimensions of hip joint prostheses, see BS 3531-10. NOTE 3 For classification of knee joint prostheses see BS 3531-12.

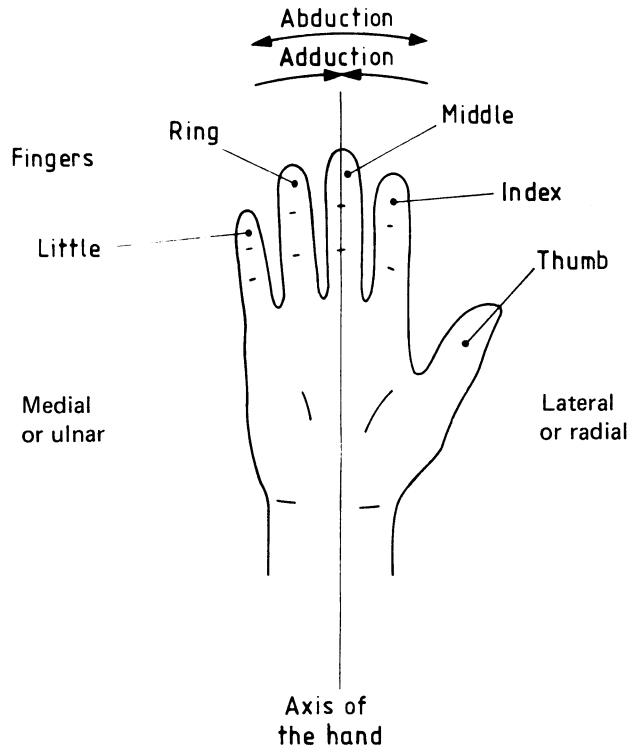

Figure 1 — The hand

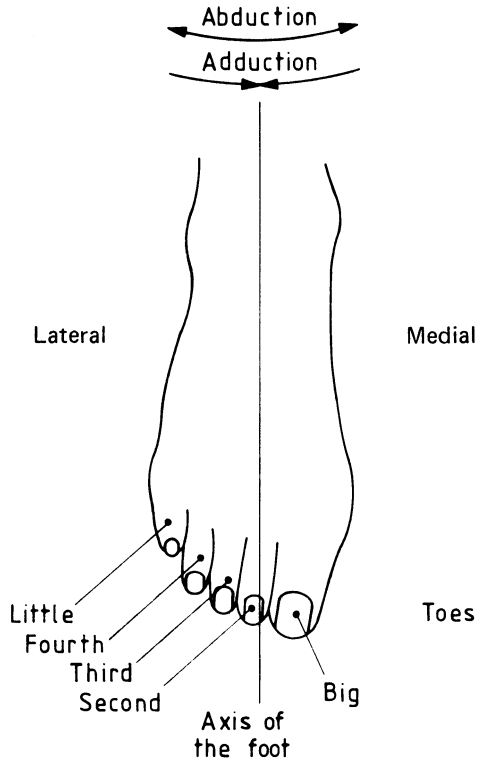

Figure 2 — The foot

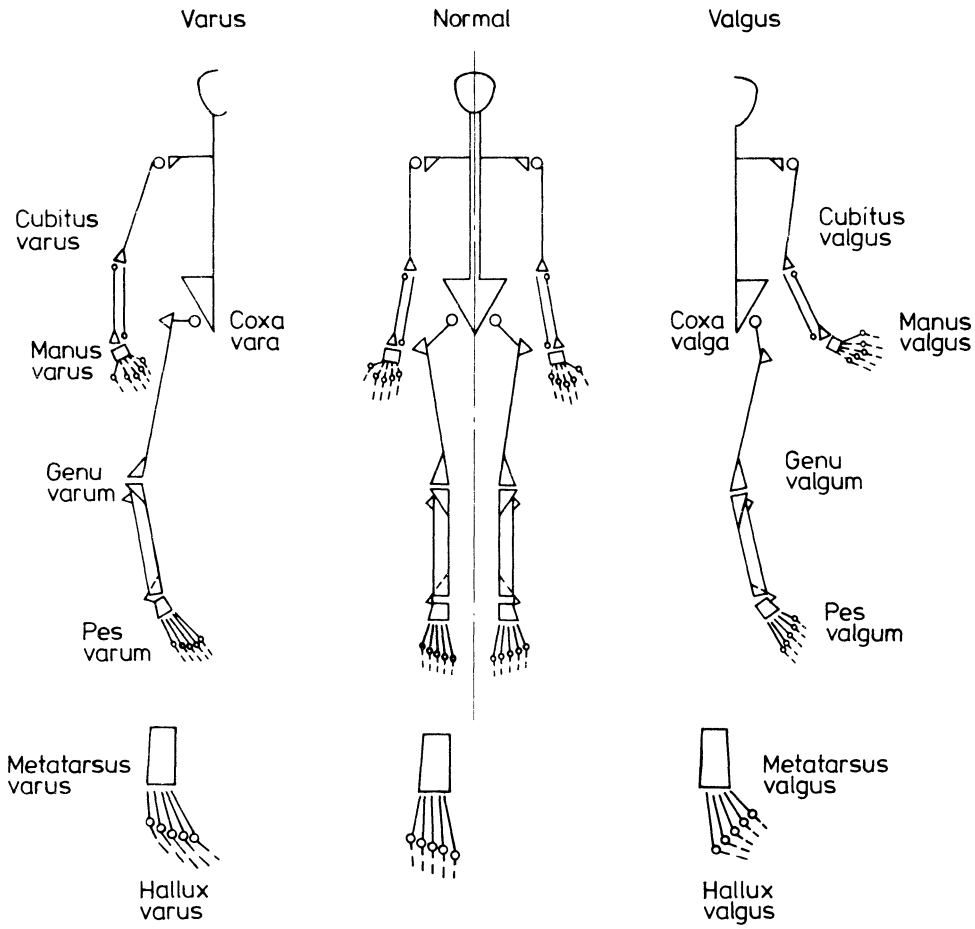

Figure 3 — Varus and valgus conditions

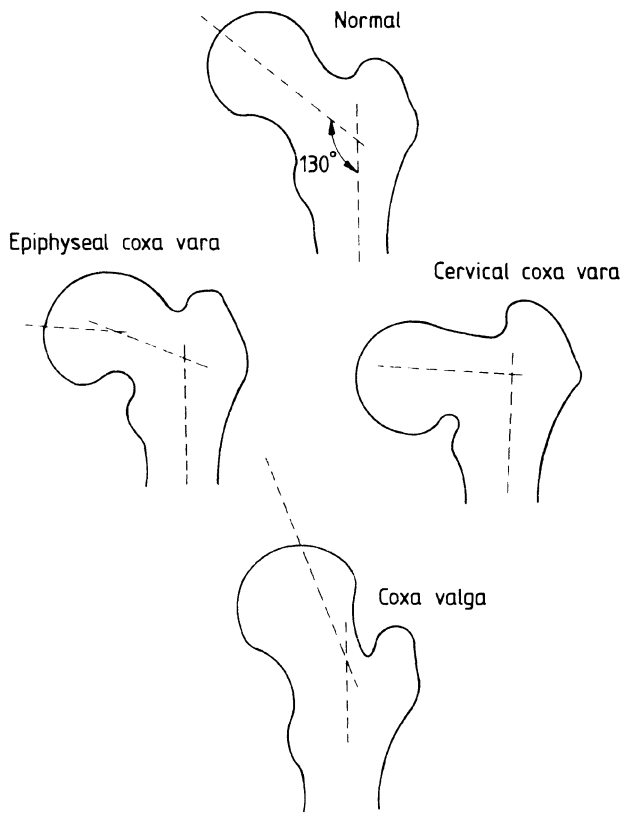

Figure 4 — Varus and valgus conditions at the upper end of the femur

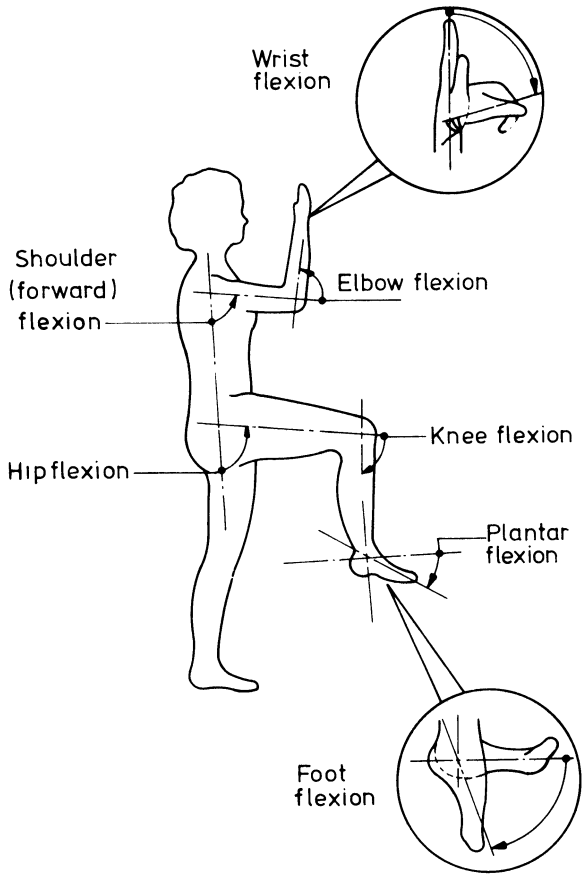

Figure 5 — Flexion movements

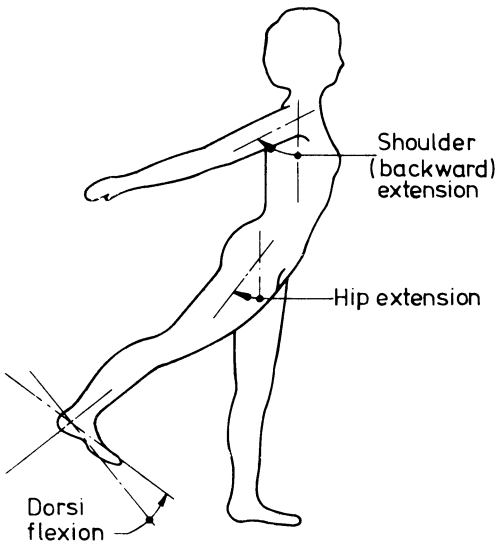

Figure 6 — Extension movements

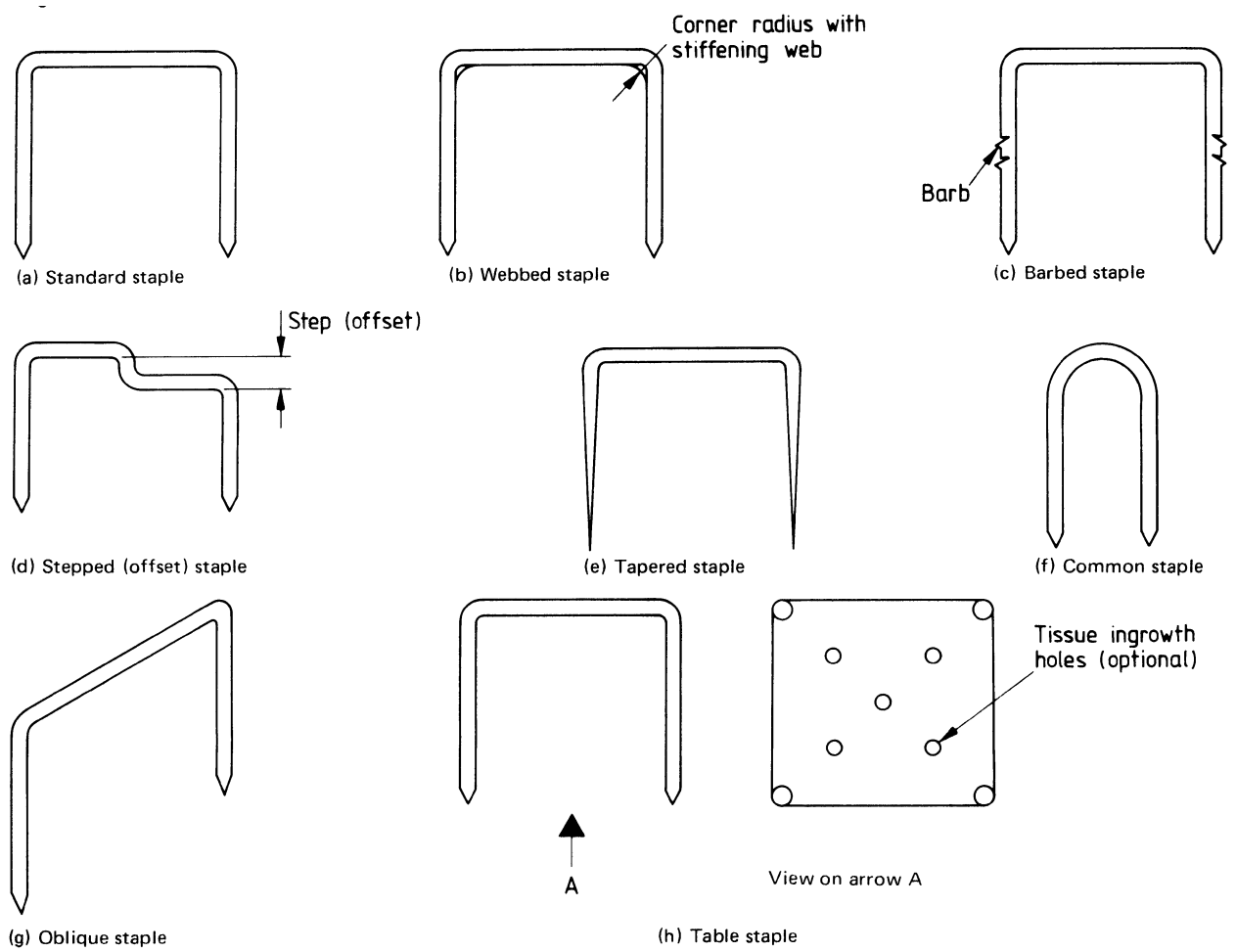

Figure 7 — Types of staple commonly used in orthopaedic surgery

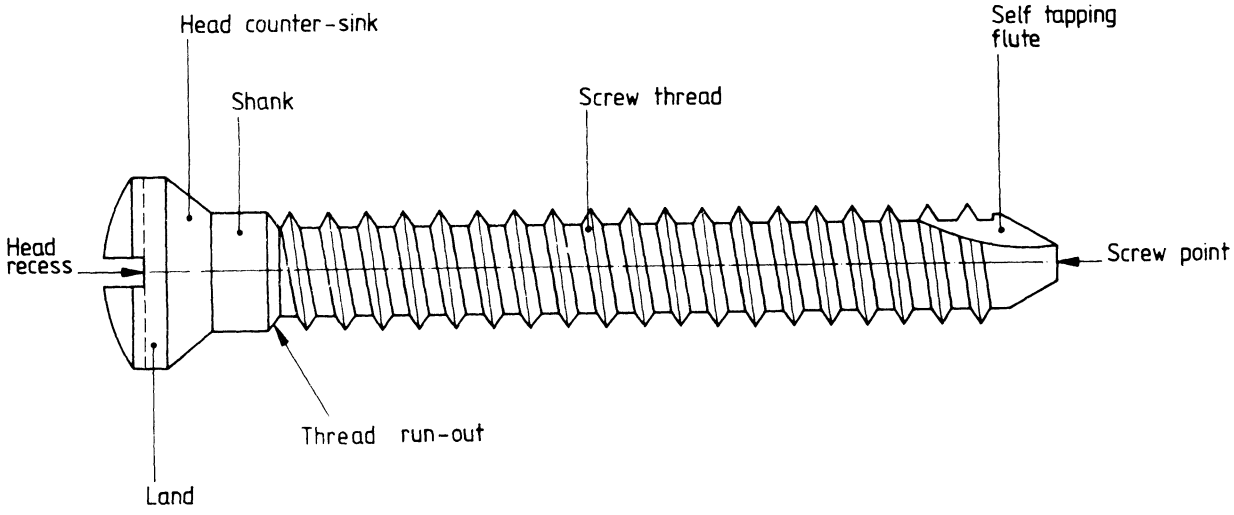

Figure 8 — Nomenclature of basic features of bone screws

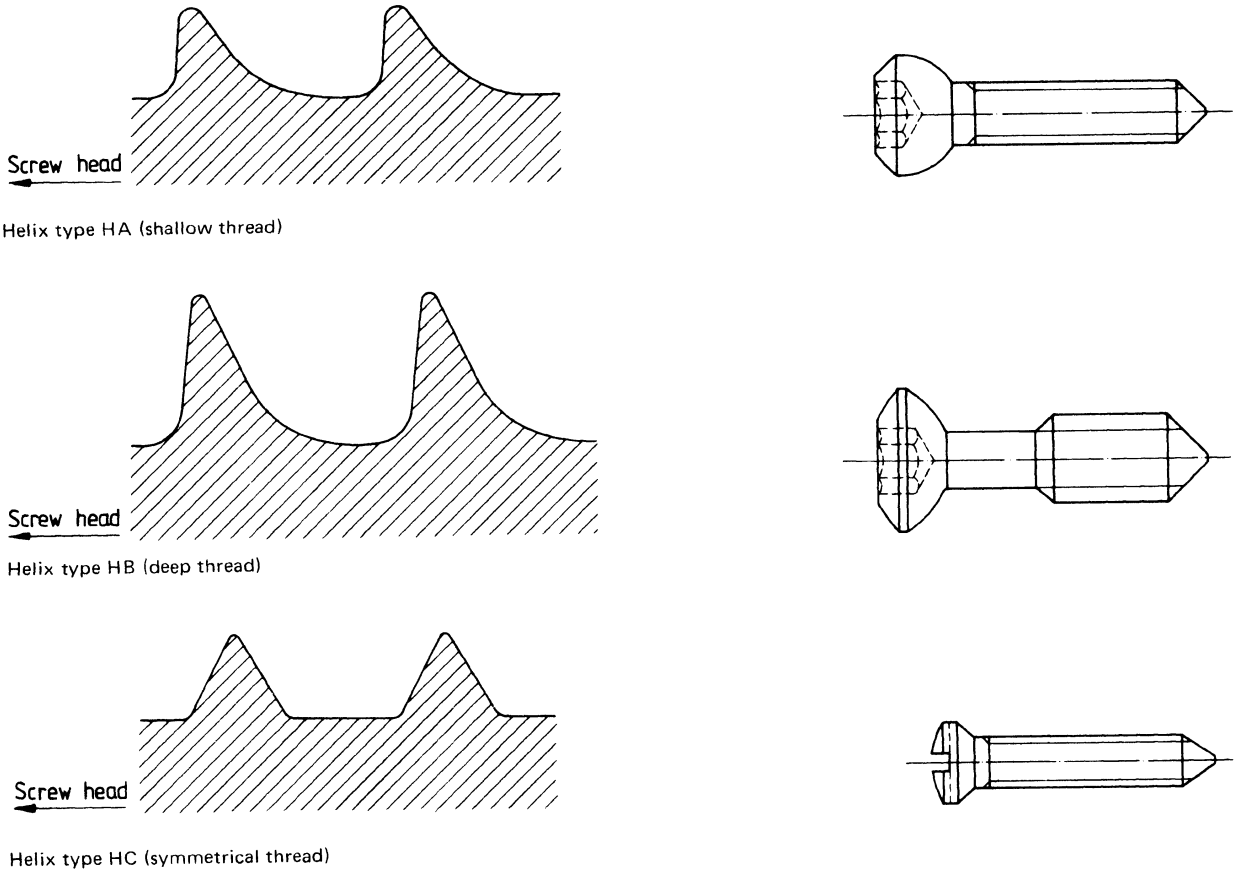

Figure 9 — Types of screw threads used in orthopaedic surgery and profiles of typical screws

Alphabetical index

The method of alphabetization used in this index is word-by-word

Entries beginning with the same word are listed in the order:

a) a single word entry;

b) the same word modified by a qualifier;

c) compound entries beginning with the same word.

The references are not to page numbers, but to term numbers. The word “see” against an entry indicates that the term itself is not defined but that information on the term may be found in the indicated entry.

Publications referred to

BS 6324, *Terms relating to surgical implants.*

BS 6324-1, *Glossary of general medical terms.*

BS 6324-2, *Glossary of terms relating to mechanics.*

BS 6324-3, *Glossary of terms relating to materials.*

BS 3531, *Surgical implants.*

BS 3531-1, *Specification for basic requirements: Finish, marking and packaging*[1)].

BS 3531-2, *Specification for materials for metal surgical implants*[1)].

BS 3531-3, *Specification for forged components made of wrought stainless steel, wrought titanium and of wrought titanium alloy*[1)].

BS 3531-4, *Specification for castings made of cobalt-chromium-molybdenum alloy*[1)].

BS 3531-5, *Specification for surgical bone screws of 4 mm, 3.5 mm and 3 mm nominal sizes, countersunk surfaces on bone plates, twist drills, taps and screwdrivers.*

BS 3531-6, *Specification for skeletal pins and wires.*

BS 3531-7, *Specification for acrylic bone cement.*

BS 3531-8, *Specification for ceramic materials based on alumina*[1)].

BS 3531-9, *Specification for general requirements for orthopaedic joint replacements.*

BS 3531-10, *Specification for classification, designation of dimensions and general requirements for partial and total hip joint replacements.*

BS 3531-11, *Specification for staples for use in orthopaedic surgery.*

BS 3531-12, *Classification and designation of dimensions for knee joint prostheses.*

BS 4106, *Surgical stainless steel monofilament wire. Fully softened.*

[1)] Referred to in the foreword only.

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