Appendix 1. Neurosurgical training requirements as of July 9, 2005

	Operative Totals Adults*		minimum = T	optimum
1.	**Head Injuries**	**Total**	**47**	**93**
	Burr holes ext. ventricular drainage /ICP-monitoring/reservoir		15	30
	Chronic subdural haematoma		10	20
	Craniotomy-extradural/subdural/intracerebral haematoma/contusions		10	20
	Depressed skull fracture		5	8
	Dural repair (CSF fistula)		2	5
	Cranioplasty		5	10
2.	**Supratent.Tumours and Lesions (excl. stereotactic procedures)**	**Total**	**40**	**61**
	Intrinsic tumours - primary/ metastatic		30	40
	Meningioma		8	12
	Pituitary adenoma (transphen. - transcranial)		0	5**
	Other benign lesions (epidermoid, arachnoidal cyst, etc.)		2	4
3.	**Posterior Fossa Lesions**	**Total**	**7**	**14**
	Primary and metastatic tumours		3	6
	Chiari malformation / Posterior Fossa Decompression		2	4
	Other benign lesions (epidermoid, arachnoidal cyst, H. Lindau, etc.)		2	4
4.	**Infection (cranial - spinal)**	**Total**	**8**	**12**
	Abscess / subdural empyema		8	12
5.	**Vascular**	**Total**	**10**	**27**
	Craniotomy Aneurysm		0	8**
	Craniotomy AVM		0	2**
	Cavernous angioma		2	5
	Haematoma (sponataneous intracerebral/intracerebellar)		8	12
6.	**Hydrocephalus (≥16 years)**	**Total**	**42**	**69**
	Shunting procedure, initial		20	30
	Shunt-revision		10	15
	Endoscopic fenestrations		2	4
	External ventricular drainage		10	20
7.	**Spine**	**Total**	**92**	**145**
	Cervical disc disease/Spondylosis: anterior decompr./foraminotomy		15	25
	Cervical instrumentation (anterior/posterior)		3	5
	Lumbar disc disease/ Spondylosis: lumbar disc		50	70
	laminotomy/ laminectomy for spondylosis		10	15
	lumbar instrumentation		5	10
	Spinal Tumours: Extradural		3	5
	Intradural extramedullary		3	5
	Instrumentation in vertebral tumours		0	5**
	Spinal Trauma: Decompression/Instrumentation		3	5
8.	**Trigeminal and other Neuralgias**	**Total**	**7**	**13**
	Injection techniques/RF-lesion		5	8
	Microvascular decompression		2	5
9.	**Stereotactic and Functional Neurosurgery**	**Total**	**5**	**23**
	Stereotactic tumour biopsy		5	10
	Surgery for epilepsy		0	3**
	Therapeutic electrostimulation (peripheral nerve, spinal)		2	5**
	Implantation of ports/pumps for intrathecal drug delivery		2	5**
10.	**Peripheral Nerve*** **	**Total**	**30**	**45**
	Entrapment decompression/transposition		30	45
11.	**Computer-aided interventions (not the procedures)**	**Total**	**10**	**25**
12.	**Basic Techniques**	**Total**		
	Craniotomy supratentorial		60	80
	Craniotomy posterior fossa		8	20

(*Continued*)

Appendix 1 (*Continued*)

	Operative totals Paediatric through 15 yrs		minimum	optimum
1.	**Hydrocephalus and Congenital Malformation**	**Total**	**7**	**15**
	External ventricular drainage		5	10
	Shunting procedure:		2	5
2.	**Head and Spine Injuries**	**Total**	**0**	**10**
	Burr holes, ICP-monitoring/drainage/reservoir		0	5**
	Chronic subdural haematoma/hygroma		0	2**
	Extra-/subdural hematoma		0	3**
3.	**Brain tumours and lesions**	**Total**	**0**	**3**
	Supratentorial tumors		0	3

Procedures that Trainees have to assist or perform in part (minimum)	assistant
Craniopharyngioma	5
Pituitary adenomas (transphen, + transcranial)	10
Acoustic neurinoma	10
Complex basal / posterior fossa meningioma	10
Craniotomy Aneurysm	12
AVM	5
Occlusive: Endarterectomy	3
Thoracic disc disease	3
Spinal Tumours: intramedullary	3
Thalamotomy, Pallidotomy/Stimulation technique	5
Implantation of ports/pumps for intrathecal drug delivery	5
Single suture craniosynostosis	2
Paediatric Infratentorial tumors	2
Meningo/meningomyelocele	3
Tethering syndromes	2
Spinal dysraphism	2
Peripheral nerve sutures (with graft)***	3

* It is of great importance that within the specific areas there is sufficient experience. If the minimum of one key procedure is not fully met, this can be counterbalanced by a comparable key procedure of the same area. The minimum operative total of each area should be attained.

** For some operations only "optimum" figures are given. Some national societies may define such operations as key procedures.

*** In a few European countries peripheral nerve procedures in the past have not been a mandatory requirement.

Explanations to Appendix 1

Key procedure

In order to make neurosurgical training comparable in the various European countries, key procedures had to be defined. Every trainee at the end of training should be able to perform these procedures independently, i.e. with a trainer supervising but not making a significant decision/practical manoeuvre during the operation. With these key procedures, a good standard of training is guaranteed which will become important when subspecialty areas are being developed.

Societies may wish to include additional key procedures and certainly can do so.

Minimum and optimum figures

Defining minimum figures of a key procedure has to take into consideration peculiarities and different situations in the various European countries. If a department cannot offer the full range of key procedures or provide sufficient volume of activity to allow the trainee to acquire the minimum figures, cooperation with another (larger) department is recommended.

Minimum figures should be attained. If the minimum of one key procedure is not fully met, this can be counterbalanced by a comparable key procedure of the same area. It is expected that the minimum operative total for each area be attained.

The optimum figures are provided as a goal for a good training programme and also to allow for competency-based training. It takes into account that trainees progress at varying rates. For some operations only "optimum" figures are indicated. National societies may define such operations as key procedures.

Assistant figures

This list contains procedures that trainees have to assist in or perform in part but with no obligation to perform them personally/independently. Most of these procedures will be learned either after finishing residency or in a subsequent subspecialty programme. The requirement of the assistant figures ensures that trainees are exposed to such complex diseases during their training and become familiar with the diagnostic procedures, the treatment options, and the follow-up required. Minimum figures should be attained.

Appendix 2. Neurosurgical training record

	NATURE OF OPERATION - Adults	T Operative Totals			Minimum Competency level end of 6th Year			Training Director's Signature
1.	**Head Injuries**	T	TS	A	1	2	3	
	Burr holes ext. ventricular drainage /ICP-monitoring/reservoir							
	Chronic subdural haematoma							
	Craniotomy -extradural/subdural/intracerebral haematoma/ contusions							
	Depressed skull fracture							
	Dural repair (CSF fistula)							
	Cranioplasty							
2.	**Supratent.Tumours+Lesions** (excl. stereotactic procedures)							
	Intrinsic tumours - primary / metastatic							
	Meningioma - vault							
	Meningioma - parasagittal							
	Meningioma - complex basal							
	Pituitary adenoma (transphen. - transcranial)							
	Craniopharyngioma							
	Other benign lesions (epidermoid, arachnoidal cyst, etc.)							
3.	**Posterior Fossa Lesions**							
	Primary and metastatic tumours (cerebellar hemisphere)							
	Arnold Chiari malformation/ Posterior fossa decompression							
	Acoustic neurinoma							
	Other benign lesions (epidermoid, arachnoidal cyst, H. Lindau, etc.)							
4.	**Infection (cranial - spinal)**							
	Abscess / subdural empyema							
5.	**Vascular**							
	Craniotomy Aneurysm							
	Craniotomy AVM							
	Cavernous angioma							
	Haematoma (spontaneous intracerebral/intracerebellar)							
	Carotid endarterectomy							
6.	**Hydrocephalus** (≥16 years)							
	Shunting procedure, initial							
	Shunt-revision							
	Endoscopic fenestrations							
	External ventricular drainage							
7.	**Spine**							
	Cervical disc disease/Spondylosis: anterior decompr./foraminotomy							
	Cervical instrumentation (anterior/posterior)							
	Lumbar disc disease/ Spondylosis: lumbar disc							
	laminotomy/laminectomy for spondylosis							
	lumbar instrumentation							
	Thoracic disc disease							
	Spinal Tumours: Extradural							
	Intradural extramedullary							
	Intradural intramedullary							
	Instrumentation in vertebral tumours							
	Spinal Trauma: Decompression/Instrumentation							
8.	**Trigeminal and other Neuralgias**							
	Injection techniques/RF-lesion							
	Microvascular decompression							
9.	**Stereotactic and Functional Neurosurgery**							
	Stereotactic tumour biopsy							
	Thalamotomy, Pallidotomy/Stimulation technique							
	Surgery for epilepsy							
	Therapeutic electrostimulation (peripheral nerve, spinal)							
	Implantation of ports/pumps for intrathecal drug delivery							

(*Continued*)

Appendix 2 (*Continued*)

	NATURE OF OPERATION - Adults	T Operative Totals			Minimum Competency level end of 6th year			Training Director's Signature
10.	**Peripheral Nerve**	T	TS	A	1	2	3	
	Entrapment decompression/transposition							
	Peripheral nerve sutures (with graft)							
11.	**Computer-aided interventions** (not the procedures)							
12.	**Basic Techniques**							
	Craniotomy supratentorial							
	Craniotomy posterior fossa							
	Transsphenoidal approach							

	Operative totals Paediatric through 15 ys	Operative Totals			Competency levels end of 6th year			Training Director's Signature
1.	**Hydrocephalus and Congenital Malformation**	T	TS	A+C	1	2	3	
	External ventricular drainage							
	Shunting procedure:							
	Meningo/meningomyelocele							
	Tethering syndromes							
	Spinal dysraphism							
2.	**Head and Spine Injuries**							
	Burr holes, ICP-monitoring/drainage/reservoir							
	Chronic subdural haematoma/hygroma							
	Extra-/subdural hematoma							
3.	**Supra- and/or infratentorial tumours and lesions**							
	Supratentorial and/or infratentorial tumors							

Definitions:

T The trainee has done the operation. The supervising consultant must not have made a decision/practical maneuver significantly affecting the execution of the operation.
TS The trainee has done the operation but the supervising consultant has made a significant decision/practical maneuver during the operation.
C The trainee has performed component parts during the operation under supervision of a senior surgeon: positioning, operative approach (i.e. craniotomy, opening) closure, drainage, draping, instructions for postoperative care.
A The trainee is the principal assistant during the operation.

Competency levels:

1 Should have assisted in, but is unable to perform the procedure.
2 Competent to perform procedure under direct supervision.
3 Competent to perform procedure without direct supervision.