



# **European Survey of Training and Practice in Clinical Neurophysiology, 2011-12**

Prepared for the EC-IFCN by  
Jonathan Cole (ExCo, member at large)

And the EC-IFCN ExCo  
Luis Garcia-Larrea (chair), Walter Paulus (sec/treas), Jonathan  
Cole and Anders Fuglsang-Frederiksen (Members at Large) and  
Mamede de Cavalho (IFCN Liaison).

February 2012.

## **The survey had 5 parts:**



- 1. Status of specialty and training in member country (32 questions)**
- 2. Competency and accreditation (3 questions)**
- 3. Training for Technicians (4 questions)**
- 4. Practice and Finance (15 questions)**
- 5. Opportunities and Threats (4 questions)**

**The presentation gives the main findings and has been agreed by the members of the EC-IFCN ExCo.**

**There were 34 responses, though not all question were answered by all.**

# Status of specialty and training



(between brackets: number of countries relative to those providing data)

**Clinical Neurophysiology a separate specialty in 36% countries (12/33)**

**Training is Board certified in 60% (19/32)**

**General internal medicine training is required in 46% (11/24) and for most is for 1 year.**

**Training to get certification is for:**

<b>1 year</b>	<b>17%</b>
<b>2 years</b>	<b>25%</b>
<b>3 years</b>	<b>17%</b>
<b>4 years</b>	<b>21%</b>
<b>5 years</b>	<b>21% (n=28)</b>

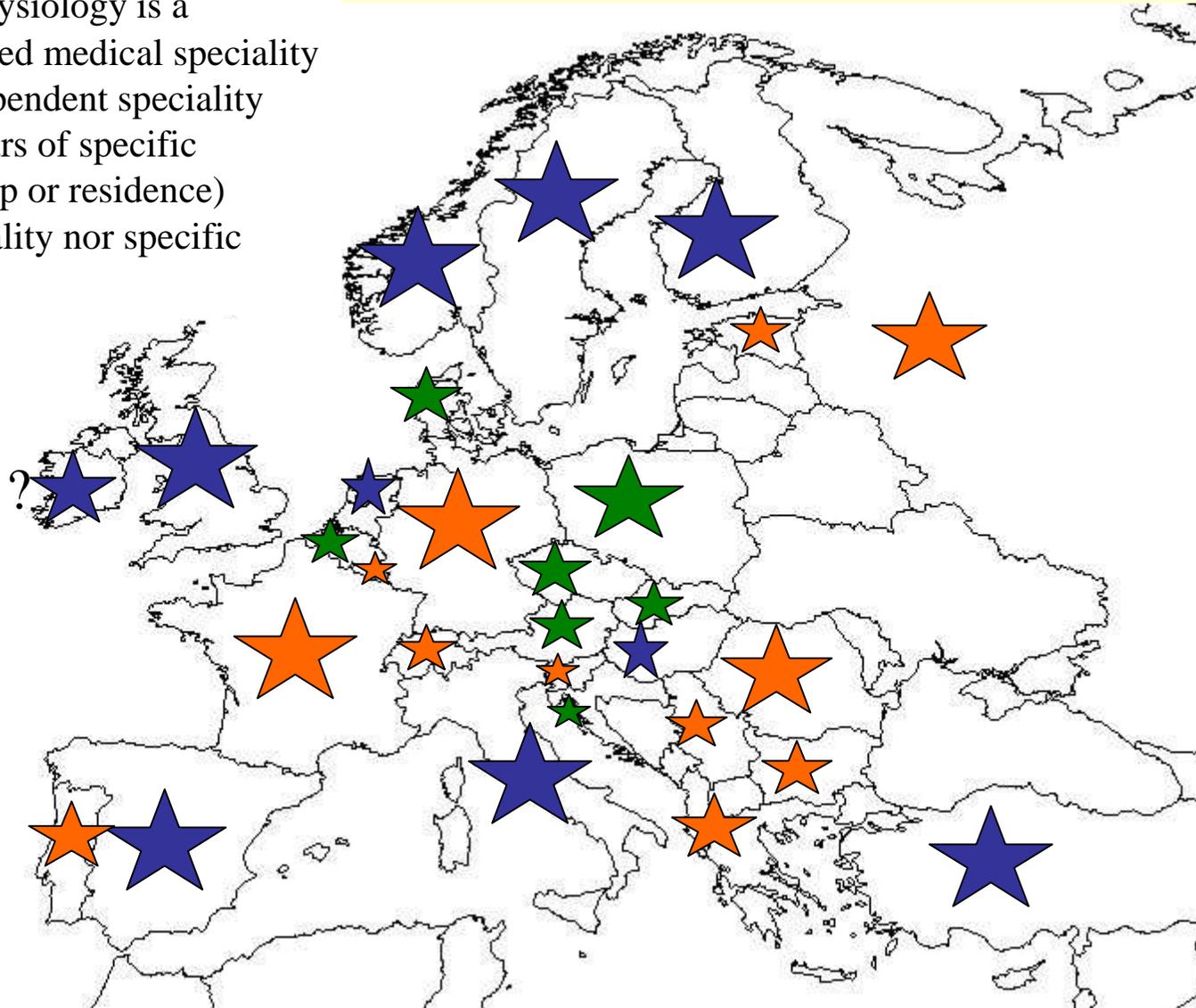
**Half had national training (54% of n=31)**

**Where CN is a monospecialty, most do neurology for 1 year (73%, 8/11)**

**Where CN is part of neurology, then neurology is done for 4-5 years (81%, 17/21)**

## Countries with or without residence / specific training in Clinical Neurophysiology (data from 2012)

- ★ : Clinical Neurophysiology is a separate recognised medical speciality
- ★ : CN, with no independent speciality status, but  $\geq 3$  years of specific training (internship or residence)
- ★ : no separate speciality nor specific training  $\geq 3$  years





# How do we examine our trainees?

**Exit exam 54% (n=30)**

**Multiple choice questionnaire 94%**

**practical skills 73% (n=15)**

**Run by:**

**University 63%**

**Medical College 13%**

**Society 34% (n=16)**

**No exam, competency judged by:**

**Log book 54%**

**Practical skills 77% (n=13)**

**Competency assessed:**

**Own consultant 62%**

**Other consultants 23% (n =13)**



## How many tests do trainees do?

### EMG

<250	26%
250-500	26%
500-750	37%
>750	11% (n=21)

### EEG

<250	22%
250-500	22%
500-750	30%
>750	34% (n=21)

More complex cases taught through a variety of ways.

## Size of clinical neurophysiology by country.



### Number of consultants per country (monospecialty status)

<50	27%
50-100	36%
>100	36% n = 11

### Number of consultants active in neurophysiology within neurology

<100	63%
100-200	16%
200-500	11%
>500	11% n = 19

### Trainees

<10	36%
10-20	39%
>20	25% n = 26

(42% have regional variations in training)



## Do we have academic posts; do we fill our jobs?

### *Negative points*

45% of countries have **NO** academic or scientific jobs in the specialty (n=31)

In 20% of countries medical students have **NO** exposure to specialty (n=30)

Training posts are **not always filled** in 58% (n=28) and consultant posts in 39% (n=28)

### *Positive points*

There is a legal requirement for training in some aspects of the subject, e.g. brain death diagnosis in 53% (n=30).

# Our continuing competency to practise



## Continuing education:

**64%** no requirement

**In those with it: 36%** run by Society

**16%** by medical college (n=31)

## Revalidation:

**64%** none

**20%** every 3 years or more, (most through national body) (n=25)

## Departmental accreditation

**71% had none (n=31)**



## Training Technicians.

Most are neurophysiology only (71%) (N=28), but many train as nurses first (38% n=29).

Training is for

<2 years	56%
2-4 years	41% (n=27)

Exit is via:

national training programme	33%
exam national body	44%
exam university	30% (n=27)

Once qualified 22% have statutory regulation (n=27).



## How are we paid for tests?

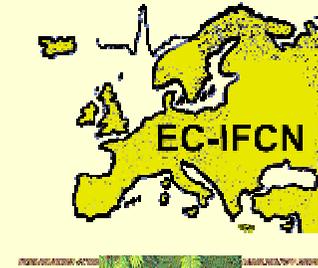
### Tests are paid by;

<b>block contracts</b>	<b>35%</b>
<b>national tariff</b>	<b>41%</b>
<b>local tariff</b>	<b>35% (n=29)</b>

### Finance by:

<b>national scheme</b>	<b>63%</b>
<b>private</b>	<b>7%</b>
<b>work insurance</b>	<b>3%</b>
<b>mix</b>	<b>40% (n=30)</b>

# Availability of Tests in Countries: EEG



**EEG routine in all departments.**

	<b>routine (%)</b>	<b>centres (%)</b>
<b>polysomnography</b>	<b>24</b>	<b>76</b>
<b>video telemetry</b>	<b>10</b>	<b>83</b>
<b>ambulatory</b>	<b>30</b>	<b>67</b>
<b>presurgical VT</b>		<b>83</b>
<b>electrocorticography</b>		<b>73</b>
<b>surface/depth records</b>		<b>80</b>
		<b>n = 28-30</b>

**The figures for routine and centre do not add up to 100%, because some tests are not done by all countries.**

# Availability of Tests in Countries: EMG



**NCS/EMG routine in all departments bar 1.**

	<b>routine</b>	<b>centres (%)</b>
<b>Single fibre</b>	<b>24</b>	<b>72</b>
<b>macro</b>	<b>10</b>	<b>73</b>
<b>quantitative MUP</b>	<b>34</b>	<b>66</b>
<b>quantitative interference</b>	<b>33</b>	<b>66</b>
<b>high density analysis</b>		<b>60</b>

**n = 28-30**

**The figures for routine and centre do not add up to 100%, because some tests are not done by all countries.**



## Availability of Tests in Countries: EPs

	routine	centres (%)
VEPs	70	30
ERG	5	95
BSAEPs	62	38
SEPs	70	30
IoM spinal cord	3	96
MEPs spinal cord	3	93
IoM cranial nerves		87

n = 28-30

The figures for routine and centre do not add up to 100%, because some tests are not done by all countries.



## Availability of Tests in Countries: Other

	routine	centres (%)
Laser EP		51
TMS	27	70
tDCS		67
Thermal thresholds	10	74
Microneurography		63
MEG		38

n= 28-30

The figures for routine and centre do not add up to 100%, because some tests are not done by all countries.



## **Who does the work?**

**Neurologists/Clinical Neurophysiologists report all EEGs. In no country do technicians do this (n=30).**

**In 53% countries technicians do nerve conduction but in only 4% do they report them (n=30, n=28). In two countries technicians can do EMG but do not report them.**

**Intra-operative monitoring is done by technicians in 43% but reported by them in only 7% (n=30)**



## **Waits.**

### **NCS (EMG)**

**4-8 weeks      63%**

**8-16 weeks    35%**

### **EMG**

**<6 weeks      43%**

**6-18 weeks    36%**

**>18 weeks    21% (n=28)**



## **Glass half full; opportunities in the foreseeable future.**

<b>Training</b>	<b>78%</b>
<b>Equipment</b>	<b>71%</b>
<b>Staffing</b>	<b>35%</b>
<b>Workload</b>	<b>17%</b>
<b>quality and guidelines</b>	<b>83% (n=23)</b>



## **Glass half empty; threats perceived to**

<b>Training</b>	<b>6%</b>
<b>Staffing</b>	<b>35%</b>
<b>Equipment</b>	<b>12%</b>
<b>Skill mix</b>	<b>24%</b>
<b>Workload</b>	<b>77% (n=17)</b>

	<b>Routinely in most depts</b>	<b>In specialist centres only</b>	<b>Not performed in the country</b>	<b>Countries</b>
<b><i>EEG</i></b>	<b>100.0% (30)</b>	<b>0.0% (0)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>NCS</i></b>	<b>96.7% (29)</b>	<b>3.3% (1)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>EMG</i></b>	<b>96.7% (29)</b>	<b>3.3% (1)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>EEG with polysomnography</i></b>	<b>23.3% (7)</b>	<b>76.7% (23)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>Visual Evoked Potentials</i></b>	<b>70.0% (21)</b>	<b>30.0% (9)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>Electroretinograms</i></b>	<b>6.7% (2)</b>	<b>96.7% (29)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>Brain Stem Auditory Evoked Potentials</i></b>	<b>62.1% (18)</b>	<b>37.9% (11)</b>	<b>0.0% (0)</b>	<b>29</b>
<b><i>Somatosensory Evoked Potentials</i></b>	<b>70.0% (21)</b>	<b>30.0% (9)</b>	<b>0.0% (0)</b>	<b>30</b>
<b><i>Intraoperative monitoring of spinal cord evoked potentials</i></b>	<b>3.4% (1)</b>	<b>96.6% (28)</b>	<b>0.0% (0)</b>	<b>29</b>
<b><i>Motor evoked potentials for intraoperative monitoring</i></b>	<b>3.3% (1)</b>	<b>93.3% (28)</b>	<b>3.3% (1)</b>	<b>30</b>
<b><i>Intraoperative monitoring of cranial nerves</i></b>	<b>0.0% (0)</b>	<b>86.7% (26)</b>	<b>13.3% (4)</b>	<b>30</b>
<b><i>Single Fibre EMG</i></b>	<b>24.1% (7)</b>	<b>72.4% (21)</b>	<b>3.4% (1)</b>	<b>29</b>
<b><i>Macro EMG</i></b>	<b>10.0% (3)</b>	<b>73.3% (22)</b>	<b>16.7% (5)</b>	<b>30</b>

	<b>Routinely in most depts</b>	<b>In specialist centres only</b>	<b>Not performed in the country</b>	<b>Countries</b>
<i>Quantitative MUP EMG</i>	<b>34.5% (10)</b>	<b>65.5% (19)</b>	<b>0.0% (0)</b>	<b>29</b>
<i>Quantitative interference pattern analysis</i>	<b>33.3% (10)</b>	<b>66.7% (20)</b>	<b>0.0% (0)</b>	<b>30</b>
<i>High density surface EMG</i>	<b>0.0% (0)</b>	<b>60.0% (18)</b>	<b>40.0% (12)</b>	<b>30</b>
<i>Threshold tracking</i>	<b>0.0% (0)</b>	<b>64.3% (18)</b>	<b>35.7% (10)</b>	<b>28</b>
<i>Ultrasound</i>	<b>30.0% (9)</b>	<b>43.3% (13)</b>	<b>30.0% (9)</b>	<b>30</b>
<i>Transcranial Magnetic Stimulation</i>	<b>26.7% (8)</b>	<b>70.0% (21)</b>	<b>3.3% (1)</b>	<b>30</b>
<i>Transcranial DC Stimulation</i>	<b>0.0% (0)</b>	<b>66.7% (20)</b>	<b>33.3% (10)</b>	<b>30</b>
<i>Videotelemetry</i>	<b>10.0% (3)</b>	<b>83.3% (25)</b>	<b>6.7% (2)</b>	<b>30</b>
<i>Ambulatory EEG</i>	<b>30.0% (9)</b>	<b>66.7% (20)</b>	<b>3.3% (1)</b>	<b>30</b>
<i>Presurgical videotelemetry</i>	<b>0.0% (0)</b>	<b>83.3% (25)</b>	<b>16.7% (5)</b>	<b>30</b>
<i>Electrocorticography</i>	<b>0.0% (0)</b>	<b>73.3% (22)</b>	<b>26.7% (8)</b>	<b>30</b>
<i>Surface and depth EEG recordings</i>	<b>0.0% (0)</b>	<b>80.0% (24)</b>	<b>20.0% (6)</b>	<b>30</b>
<i>Thermal Threshold testing</i>	<b>10.0% (3)</b>	<b>73.3% (22)</b>	<b>16.7% (5)</b>	<b>30</b>
<i>Laser Evoked Potentials</i>	<b>0.0% (0)</b>	<b>51.7% (15)</b>	<b>48.3% (14)</b>	<b>29</b>
<i>Microneurography</i>	<b>0.0% (0)</b>	<b>63.3% (19)</b>	<b>36.7% (11)</b>	<b>30</b>
<i>Magnetoencephalography</i>	<b>0.0% (0)</b>	<b>37.9% (11)</b>	<b>62.1% (18)</b>	

## Some final comments & perspectives



In the light of the preceding results, the European Chapter recommends:

- To promote Clinical Neurophysiology as a *visible discipline*, recognised as such in most European countries and as a separate medical speciality in 40% of them
- To distinguish *different European modes of access* to the practice of CN, as a function of its level of recognition in different countries;
- To encourage the setting of *minimum standards* to ensure that practitioners of CN are adequately trained, whatever the status of the discipline in their country, and
- To *collaborate with the UEMS\** in establishing different “core curricula” setting these standards, to ensure adequate training in countries with and without a separate speciality.

\* *European Union of Medical Specialists, <http://www.uems.net/>*

**All these data are available via SurveyMonkey:**

**ClinicalNeurophysiologyEuropeanChapter**

**password clineuphy.**

**[http://www.surveymonkey.net/MySurvey\\_Responses.aspx?sm=X15sUUctY9cIt0YfRsNtYrI1W2acUvocao3pwE4BTtIG1NDKvJNBTED5pL408h](http://www.surveymonkey.net/MySurvey_Responses.aspx?sm=X15sUUctY9cIt0YfRsNtYrI1W2acUvocao3pwE4BTtIG1NDKvJNBTED5pL408h)**