

# Results of the 2012 third survey on Nephrology resident training

Francisco Ortega-Suárez, non behalf of the National Nephrology Commission\*

Nefrologia 2014;34(3):323-9

doi:10.3265/Nefrologia.pre2013.Dec.12308

## ABSTRACT

The second survey for tutors and the third for residents of the Spanish Society of Nephrology and the Spanish National Commission of Nephrology in 2012 compared with those of 2004 and 2007. 64% of tutors but only 24.6% of resident physicians participated. Tutors: improvement in educational infrastructure. Improvement in teaching organisation and in resident activity reporting. Clear improvement in teaching and in resident assessment. They believe that there should be a five year training period and a compulsory examination at the end of the residency. Resident physicians: improved satisfaction with teaching received with respect to previous surveys, except with regard to renal biopsies and pathological sessions. Improvement in formal training; experience in transplantation (only poor in 7%); experience in peritoneal dialysis (still poor in 21%); level of tutoring (poor in 20%); performance and quality of clinical sessions; scientific activity; quality of training of your service: good/very good in 66% in 2012 versus 26% (2004) and 46% (2007).

**Keywords:** Survey. Tutors. Post-graduate fellows. Training.

The definition of competent training is continually evolving and changing.<sup>1</sup> As a result, there are various methods for defining our position and therefore our strengths and weaknesses: surveys, expert reports, examinations, etc. A detailed report commissioned by the American Society of Nephrology (ASN) to J. Berns,<sup>2</sup> carried out through an internet survey to all ASN members, established the deficiencies of

**Correspondence:** Francisco Ortega Suárez  
Comisión Nacional de Nefrología. (Spain).  
ortegafrancisco491@gmail.com  
fortega@hca.es

## Resultados de la tercera encuesta de 2012 sobre la formación docente del residente de Nefrología

### RESUMEN

Segunda encuesta a tutores y tercera a residentes de la Sociedad Española de Nefrología y la Comisión Nacional de Nefrología en 2012, comparada con las de 2004 y 2007. Un 64 % de participación de tutores, pero 24,6 % de MIR. Tutores: mejoría de la infraestructura docente. Mejora en la organización de docencia y en la recogida de actividad del residente. Mejoría en formación. Mejoría indudable de la docencia y de su evaluación. Opinan: formación de cinco años y examen obligatorio al final de la residencia. Médicos residentes: mejoría de la satisfacción con la docencia recibida respecto a anteriores encuestas, excepto en biopsias renales y sesiones anatomopatológicas. Mejoría en formación perfectamente reglada; experiencia en trasplantes (solo mal en el 7 %); experiencia en diálisis peritoneal (todavía mal en el 21 %); grado de tutorización (mal en el 20 %); realización y calidad de sesiones clínicas; actividad científica; calidad de la formación de tu servicio: bien/muy bien en el 66 % en 2012, frente al 26 % (2004) y el 46 % (2007).

**Palabras clave:** Encuesta. Tutores. Residentes. Formación docente.

the American Nephrologist training system. It is obvious that in these initiatives, the support of scientific Nephrology societies<sup>3</sup> is crucial and this has likewise been the case in Spain.

In effect, since 2004, we have been conducting surveys for tutors and residents in our country and in October 2007, Nephrology tutors met together at the Ministry of Health. This continued effort has been made possible in a large part thanks to the Spanish Society of Nephrology (S.E.N.), which is increasingly the case since support from the Ministry of Health tends to be minimal.

## \*Group Consists of:

Chairman: Francisco Ortega. Vice-chairman and Secretary: Carlos Quereda. Members: Carmen Bernis, Pablo Justo, Rafael Matesanz, Antonia Sans, José Luis Górriz and Alberto Martínez Castela

During the second half of 2012, new surveys were distributed to third (R3) and fourth (R4) year Nephrology residents, as well as to tutors and the results were compared with those of the two previous surveys of June 2004<sup>4</sup> and September 2007<sup>5</sup> for residents and with that of 2007 for tutors, since no survey was given to the latter in 2004. It must be noted that on the two first occasions, the surveys were given to all residents, while the third survey was only intended for R3 and R4.

## TUTOR SURVEY

### Participation

Forty-five surveys were completed (64.3% of the total 70 teaching units) on both occasions (2007 and 2011).

### Tutor data

There was a younger tutor population with respect to the previous survey (27% >50 years old in 2012 versus 40% in 2007) and a similar sex ratio. As regards academic qualifications, the percentage of doctor tutors has decreased from 56% to 51%, with professors increasing at the expense of associates (from 38% to 44%). In terms of professional profile, the percentage of heads of section increased considerably (44% in 2012 versus 15% in 2007), with a decrease in assistants (50% versus 80%) as a corollary. As we can see, the tutor group was younger, as we mentioned before, due to the increase in the 11-20 year stretch in the time exercised as a specialist (60% versus 35%) and a decrease in that of 21 to 30 years (9% versus 35%). This renewal of tutors is logically noted in the shorter time that they have worked as tutors (from 1 to 5 years: 69% of tutors in 2012 versus 51% in 2007).

Therefore, the Nephrology tutor profile has changed with respect to 2007. The current tutor is an assistant (50%) or head of section (44%), while in the 2007 survey 80% were assistants. They are predominantly male (58%), although this percentage is decreasing (before it was 60%), younger, 40-50 years old (55%) with less professional experience and less time spent as a tutor (from 1 to 5 years: 69%).

### Data for the teaching unit

Its size seems to have decreased, if we go by the inhabitants in its corresponding health area (<500,000 in 81% of units in 2012 versus 71% in 2007), its number of doctors (12 or fewer in 86% versus 78%) and its number of beds (20 or fewer in 82% versus 78%).

With regard to the structure of the teaching units, it seems to have improved since the number of patients in the

corresponding hospital haemodialysis unit (HHD) (11% of teaching units now have fewer than 40 patients, compared with 24% in the previous survey of 2007), the number of peritoneal dialysis (PD) patients in their care (25 or fewer in 35% versus 47%) and the number of patients with kidney transplants (25% of teaching units with their own transplant unit now perform 25 or fewer transplantations per year, compared with 32% in the 2007 survey) have increased. In spite of this, it must be noted that a significant number of our teaching units are still in a precarious situation: approximately one third have fewer than 25 patients on PD and a quarter of them perform fewer than 26 transplantations per year.

The availability of an approved experimental research unit that is dependent on or closely related to the service continues to be the same as in 2007: approximately half lack one.

Renal biopsies by doctors from the teaching unit service continue to decrease: it is currently 49% versus 60% in 2007, which is overwhelmingly confirmed in the corresponding resident survey, as we will see later.

The indication and control of patients with acute renal failure has improved, since the percentage of teaching units in which the main doctor is the nephrologist or the nephrologist in coordination with the intensive care unit doctor has increased from 44% and 5% in 2007 to 51% and 22%, respectively, in 2012.

In summary, the infrastructure of the means available to teaching units has improved, except in relation to performing renal biopsies.

### Organisation of teaching activity

As in 2007, approximately one third of teaching units currently have two residents per year, and two thirds have one. The total number of residents in Spain has slightly decreased from 226 to 219.

There has been a major improvement in the availability of teaching protocol (guidelines) provided to residents, in which the specific teaching criteria of the unit/service are specified (organisation of rotations, shifts, progressiveness and supervision of care, sessions, etc.): 96% of teaching units in 2012 versus 77% from the 2007 survey, as well as the existence of an optional rotation period for residents (91% versus 66%). Progress with regard to teaching service/unit formal meetings to discuss issues related to teaching activity has been more modest but significant nonetheless (76% versus 69%) and agreements with other units to perform rotations that cannot be carried out in the unit itself (69% versus 62%). The abovementioned rotations, by order of frequency, were: 1) in 2007: Renal

transplantation; Continuous ambulatory PD; Clinical Nephrology; Special haemodialysis techniques; Paediatric nephrology; Pathology; and 2) in 2012: Renal transplantation on 20 occasions; PD, Special techniques and Primary Care each on one occasion.

General hospital and service clinic sessions, as well as those given by residents, remained in more than 90%. Seminars given by the medical staff (in the current survey, 73% of teaching units responded that they were carrying them out, versus 64% in the 2007 survey) and nephropathology sessions are improving (87% in the latest survey versus 73% in the 2007 survey).

In summary, we may say that there has been a substantial improvement in the organisation of Nephrology residents' teaching activity.

### Data on tutor duties

The number of resident tutors in the unit/service has increased, since one third of the teaching units have two or more tutors (34% versus 7% in 2007). In addition, if there are two or more, resident tutoring is divided up: one coordinates the residents and the other coordinates teaching for the service, but the specific time that is available to them is none (76%) or insufficient (20%). In the previous survey, the percentages were 80% and 16%, respectively.

Despite time constraints, tutor duties, which could be improved, have increased, as shown in Table 1. There has been an increase in session organisation percentages (98% in 2012 versus 90% in 2007), annual resident assessments (100% versus 98%), personal support for each resident (98% versus 89%), development of the teaching guidelines (84% versus 75%), completion of the annual teaching report (87% versus 68%) and many other duties have been carried out, such as the preparation of communications and publications, theoretical training tutoring, certification of all the teaching sessions by the Quality Agency, monthly or quarterly interviews with each resident, afternoon meetings with all residents (monthly), attendance at courses and conferences, implementation of lines of research, supervision of resident research, etc. As regards the questions "How are formal meetings held with residents to assess fulfilment of objectives and problem identification?" and "How do you carry out resident activity reporting procedures?" respectively, the improvement was evident: the meetings have become more formal, since they are now scheduled beforehand in 51% of teaching units versus 18% in 2007 or the resident activity reporting procedures appeared in the service reports in 51% of services in 2007 versus 62% in 2012 or were displayed in 48% of resident reports in 2007 versus the 58% that currently do so.

**Table 1.** Tutor duties

Duty	2007	2012
Organising rotations	100%	100%
Organising teaching sessions	90%	98%
Annual assessments of residents	98%	100%
Individualised support for residents	89%	98%
Developing the unit's teaching protocol	75%	84%
Writing the annual teaching report	68%	87%

### Considerations about the efficiency of the training system in the corresponding teaching unit

When the tutors were asked what the average training level of their residents is as clinical nephrologists, the response has improved in the latest survey: 89% believed that it was good (71% or excellent (18%), versus 79% (64% good + 15% excellent) in 2007. However, the low percentage who thought that it was poor has increased from 2% (2007) to 4% (2012).

On rating the following aspects from 1 to 10 (clinical training, theoretical training, knowledge of the literature and the ability to revise a subject, the ability to design and conduct a clinical research subject and the self-learning ability) of their current residents at the end of the training period (Table 2), the responses show that the opinion of the tutors is that there was an improvement in all categories, except for research ability, which was still low and was worse than in the 2007 survey (16% gave a low rating in 2012 versus 7% in 2007).

Despite the foregoing, which points to improvements in all responses, paradoxically the belief according to which the current average level of training has worsened has continued to grow with regard to the previous survey. In effect, if the percentages of the opinion that training was similar, better or much better than that which residents had ten years previously was 14%, 42% and 0% in 2007, respectively, the current percentages are 29%, 20% and 4%. The reasons given were: "Worse level of training of Medicine students" (20% of tutors in 2012 compared with 11% in 2007), "Lower numbers of resident physicians come to Nephrology" (57% versus 24%), "The resident physician system does not distinguish the best candidates like before" (40% versus 13%), "Current residents have less interest in working for their training" (47% versus 35%) and "The number of years of training is insufficient to achieve an adequate level" (27% versus 15%). Nevertheless, the self-esteem of medical staff, or at least that of its tutors, has improved, since 17% currently respond "yes" to the question "Are current medical staff less interested in teaching?" versus 24% in 2007.

**Table 2.** Grade the following aspects of your current residents from 1 to 10 after they complete the training period

	< 5		From 5-6		From 7-8		From 9-10		
	2007	2012	2007	2012	2007	2012	2007	2012	
Training as clinical nephrologists	5%	0%	7%	4%	53%	71%	35%	24%	Better
Theoretical training	7%	0%	24%	22%	64%	56%	7%	20%	Some what better
Knowledge of the literature and ability to review a subject	7%	0%	14%	9%	62%	69%	18%	20%	Some what better
Ability to design and conduct a clinical research subject	7%	16%	44%	38%	49%	44%	0%	2%	Similar deficit
Self-learning ability	7%	2%	22%	22%	67%	67%	5%	9%	Similar

On summarising the opinion about the “Consideration of the current resident training assessment system” the poor or very poor option has improved and is no longer the majority opinion, since 53% of tutors in the 2007 survey rated it as very poor or poor, 2% and 51%, respectively, versus 42% (2% and 40%, respectively). As regards the usefulness of the resident training assessment system, opinions have changed: if in 2007 it was believed that it did not distinguish between residents who did not achieve the minimum objectives to carry out their specialty and those who did (40% disagreed that it was useful versus 33% who believed it was useful), in 2012, the latter opinion seems to have increased (35% disagree and 49% agree). For the rest of the options (“It is useful for knowing the level of training achieved by the resident”, “It helps the resident to progress in their training” and “It is a good guide for selecting candidates for specialist positions”), the belief remains that the current resident training assessment system is not useful in similar percentages in both surveys.

In relation to specific training for research, the survey would be intended for: a) resident participation in research projects developed in the service, which continues to be equally low; b) presentation at conferences, which has even decreased (in 37% of the teaching units, almost all residents gave a presentation at a conference during their residency in the 2007 survey versus 20% in 2012), although marking it as an objective has improved (53% versus 69% currently), which is the same as c) producing publications: on responding to the question “Is it a compulsory target that the resident produce a publication during their residency”, 29% of teaching units replied “yes” in the 2012 survey versus 41% in the 2007 survey, respectively.

An important aspect that was addressed in both the 2007 and 2012 survey was the duration of the Nephrology residency. The opinion of tutors continues to change towards an increase to five years (64% of those surveyed believed this in 2012 versus 49% in 2007), to the detriment of its current duration of four years (42% in 2007 versus 31% in 2012).

The opinion that there should be a compulsory examination at the end of the residency has also increased considerably (58% of tutors in 2012 versus 40% in 2007), with 74% currently preferring a mixed examination (multiple choice test and discussion of a clinical case).

## SURVEY FOR RESIDENT PHYSICIANS

The number of surveys completed on this occasion was 30, i.e. 24.6% of the total of R3 and R4, which is a low response rate, the worst of the three surveys carried out despite the efforts of the S.E.N. In the previous second survey, of 2007, there were 101 responses and 77 in the first, of 2004. Nevertheless, if we go by the surveys responded to by R3 and R4, to the first of 2004, 57% replied (36% from R3 and 21% from R4), and to the second, of 2007, 36% from R3 and 64% from R4 did so, and to this third and latest, 13% (8 surveys out of 60 from third year resident physicians) from R3 and 36% (22 out of 62) from R4 responded. We considered that the percentage of responses was so low in R3 that it was not worth studying them separately, but that the overall percentage of R3 and R4 could be acceptable. This opinion was held because an article from the United States had just been published in the Clinical Journal of American Society of Nephrology in which only 22.9% of the total possible respondents participated in a survey for

nephrologists in that country on the factors that made them choose Nephrology as a specialty.<sup>6</sup>

Both in the “Overall degree of fulfilment of the objectives of your rotation by Medicine, Medical Specialties and other rotations” and in “Consideration on your Nephrology training (from free will 1 to completely formal 5)”, clear improvements were detected and they have been improving since 2004: 70% of those surveyed answered “good” or “very good” to the first question in 2012 versus 52% in 2007 and 19% in 2004, and 96% answered that it was “acceptable, good or very good” (2012) versus 84% (2007) and 77% (2004) to the second question.

With regard to the techniques, on marking from 1 (never/none) to 5 (more than 5) the number of interventions that they carried out as the main person in charge or as an assistant with high responsibility in several interventions, we see that the situation with regard to performing renal biopsies remains at worrying levels (38% in 2004, 49% in 2007 and 48% in 2012 said that they carried out 5 or more during their residency), with 45% of residents saying that they did not perform any (50% in 2004 and 34% in 2007). However, peritoneal catheter insertion is increasing: 18% in 2004, 25% in 2007 and 42% in 2012 responded that they did so on 5 or more occasions. Catheters for haemodialysis (Shaldon and similar), seems to have reached a maximum (both in 2007 and in 2012 the response of 5 or more occasions was 96%).

Sufficient responsibility in the knowledge and management of renal transplantation has improved considerably and they are considered to be acceptably trained in this area: 49% said in 2004 that the training was good or very good versus 53% in 2007 and 76% in 2012. Now only 7% said that it was non-existent or very poor in 2012 (30% in 2004 and 23% in 2007).

Although sufficient responsibility in PD has improved a lot and residents are considered to be acceptably trained in this area (27% in 2004, 35% in 2007 and 43% in 2012), 21% still said they did not have contact or it was very insufficient in 2012 (47% in 2004 and 34% in 2007).

When rating their degree of progressive responsibility as residents, in 2012, 10% responded that it was acceptable, 53% that it was good and 43% that it was very good, with the total of these three responses being 96%. This very favourable situation was already observed in the 2007 survey (99%). This question did not appear on the 2004 survey.

There has been a clear improvement in the perception of the training tutoring level from each Nephrology service, since we observed that in 2012, 60% of residents surveyed graded it as good or very good, with an additional “acceptable” in another 17% versus 42% in 2007. However, in the latest survey, there continues to be 20% who say they were poorly

tutored, although in 2007, 7% were not tutored at all and very poorly in 20% (in the 2004 survey, this question was not asked).

In the sessions section, with regard to the service’s clinical sessions, there were major improvements in all aspects analysed. The residents firstly graded their frequency: 70% in 2012 stated that they were carried out weekly or fortnightly versus 61% in 2007 and 52% in 2004. Subsequently, when asked about their quality (practical aspect, new contributions, opinions, etc.), 83% thought that it was good or very good in 2012, versus 56% in 2007, and that their degree of personal participation in them was good or very good in 80% of cases in 2012, versus 71% in 2007. In contrast to the tutor survey, we cannot say the same about pathological sessions in the service; the residents’ grade with regard to their frequency is deplorable and has furthermore progressively worsened since 2004: only 30% of residents stated that there were one or two sessions per month and 43% stated that there were never or almost never sessions in 2012 (35% and 42%, respectively, in 2007 and 42% and 47%, respectively, in 2004).

When asked if they had received a continuous formal training programme in their service, the response showed an improvement (56% stated that it was good or very good in 2012 versus 43% in 2007. In 2004, this question was not asked). However, there were still 37% in 2012, similar to 2007 (34%), who said that it was poor or very poor.

The 2012 response to carrying out shifts in the Nephrology service was that they always required physical presence (94% in 2007).

When grading the scientific activity of their service from 1 to 5, the response has improved and was good or very good in “Communications at national conferences” in 50% in 2012 versus 29% in 2007, in “Communications at international conferences” in 19% versus 11%, in “National publications” in 33% versus 20%, and in “International publications” in 11% versus 12%. However, around one third of residents still responded “None or almost none” in the first three sections and 40% in the last section “International publications”.

At the end of the surveys, in the overall question “What grade do you consider that your service has in terms of training Nephrology residents (1 very poor to 5 excellent)?” (Table 3), progression was spectacular, since 66% of those surveyed in 2012 versus 46% of those surveyed in 2007 and 26% in 2004 responded that it was good or very good. In spite of this fact, there were still 13% in the most recent survey who said that the training was quite poor (0% poor), although in 2007 it was graded as poor by 3% and quite poor by 11% and by 10% and 24%, respectively, in 2004, which should encourage us to continue along the same lines.

## CONCLUSIONS

1. In comparison with the participation of tutors, which was around two thirds in both surveys carried out (2012 and 2007), the low current interest of the resident physicians in giving their opinion to the S.E.N. and the Spanish National Commission of Nephrology is notable; the percentage of responses from R3 was so low that it was considered not worth studying them separately. However, the percentage in R4 may be acceptable, without excluding the possibility of bias, compared to the other two previous surveys of 2004 and 2007. Consequently, there is still a wide margin for improvement, since a high number of resident physicians did not respond.
2. The age of tutors has decreased.
3. The comparison of the 2012 tutor surveys and those of the residents shows a very positive progression and furthermore, in most cases, there has been a clear improvement from the first survey in 2004, although it is necessary to judge and examine these findings.
4. The infrastructure of teaching units has improved. It is true that the number of beds, medical staff and population treated is smaller. This must be due to training in the last few years, which has always fallen in smaller units. However, there have been improvements in areas where there was a clear deficit, with an increase in the number of patients on HHD, PD and having kidney transplants, although one third of teaching units do not have a sufficient number of patients on PD and a quarter carry out few transplantations each year, which compromises suitable training. Another aspect in which there has been an improvement is the indication and control of patients with acute renal failure by the nephrologist. Furthermore, the number of renal biopsies carried out in Nephrology services remains stagnant, with the result that no fewer than 45% of residents responded in the survey that they have never performed a renal biopsy, which is not justified because they are done outside the service and even by external staff (radiologists, for example). The availability of an approved experimental research unit that is dependent or closely related to the service continues to be present in approximately half of all teaching units.
- 5) The organisation of teaching activities and fulfilment of teaching objectives have also improved, as recognised by tutors and residents, in all aspects that were surveyed: teaching guidelines, which practically all teaching units now possess, resident activity reporting, optional rotation, formal meetings to discuss teaching activity, agreements with other teaching units to complete the programme, sessions (except nephropathology sessions, for which there were contradictory opinions, since they improved according to the tutors and worsened according to the residents) and seminars.
6. The role of tutoring has improved, although not in terms of the time that tutors have to carry out their duties, which continues to be poor. But the number of tutors has increased and it seems that the tasks are better organised and shared. In many aspects, listed above, there have been improvements. Furthermore, in the latest resident survey, a fifth of participants still said that they did not receive much tutoring and somewhat more than a third did not have a continuous formal training programme in their service.
7. Efficiency seems to have improved with respect to the previous situation. In fact, the average level of resident training as clinical nephrologists, their theoretical training, knowledge of the literature and the ability to revise a subject and self-learn according to the tutors and the carrying out of non-nephrology rotations in accordance with the specialty's teaching programme, techniques (except for the very poor renal biopsy performance rate) and adequate responsibility in renal transplantation, haemodialysis and PD (however, a fifth of residents still said that their contact with PD was non-existent or minimal, although this figure was almost half that of 2004), among others, expressed by the residents confirm this. In addition, overall, two thirds of residents believe that their service has given them good or very good training. However, a majority of tutors continue to believe that the average level of training of the residents is worse than ten years ago for very different reasons.
8. Consequently, scientific training and corresponding activities, participation in the service's research projects, communication presentations, publication of articles, etc., remain low, although there has been an improvement in setting it as a target.

**Table 3.** You consider that your service has the following grade in terms of training Nephrology residents (1 very poor, 5 excellent)

	2004	2007	2012
1	10%	3%	0%
2	24%	11%	13%
3	40%	39%	20%
4	24%	36%	53%
5	2%	10%	13%

9. With respect to the current usefulness of the resident training assessment system, the majority opinion is that it is not useful for knowing the training level achieved by the resident, it does not help them to progress in their training and it is not a good guide for selecting candidates for specialist positions. Although one thing that has improved is that now they believe it is useful for distinguishing between residents who did and did not achieve the minimum targets for performing their specialty.
- 10) Other aspects consulted were:
- That there is an increasing majority of tutors who believe that Nephrology resident training should last five years, in accordance with that stated on numerous occasions by the S.E.N. and the Spanish National Commission of the Specialty of Nephrology and also by the European Union. This opinion emerged at the end of the nineties, both in Europe<sup>7,8</sup> and in Spain.<sup>9</sup> As such, there are practically no Nephrology resident training programmes in Europe lasting less than five years and it is practically the same in Latin America.
  - A majority of tutors also believe that at the end of the residency there should be a compulsory mixed examination (multiple choice test and discussion of a clinical case).

In summary, we have improved, but as stated in the recent study by the Spanish National Commission of Nephrology,<sup>10</sup> there is still work to be done to improve the training of our resident physicians and therefore make Nephrology more attractive to young doctors who are finishing their studies and who must choose a specialty.

### Conflicts of interest

The authors declare that they have no conflicts of interest related to the contents of this article.

### REFERENCES

- Perazella MA. Nephrology fellowship training in the 21st century: where do we stand? *Clin J Am Soc Nephrol* 2010;5:387-9.
- Berns JS. A survey-based evaluation of self-perceived competency after nephrology fellowship training. *Clin J Am Soc Nephrol* 2010;5:490-6.
- Rosner MH, Berns JS, Parker M, Tolwani A, Bailey J, DiGiovanni S, et al.; ASN In-Training Examination Committee. Development, implementation and results of the ASN in-training examination for fellows. *Clin J Am Soc Nephrol* 2010;5:328-34.
- Comisión Nacional de Nefrología. La «Encuesta a los residentes de Nefrología españoles», presentada en Octubre de 2005 por Blanca Miranda en el XXXV Congreso de la Sociedad Española de Nefrología (S.E.N.).
- Quereda C, por la Comisión Nacional de la Especialidad de Nefrología en España. Algunos aspectos de la situación de la formación de especialistas de Nefrología en España. *Nefrología* 2008;28:263-71.
- McMahon GM, Thomas L, Tucker JK, Lin J. Factors in career choice among US nephrologists. *Clin J Am Soc Nephrol* 2012;7:1786-92.
- Programme for harmonization of training in nephrology in the European Union. *Nephrol Dial Transplant* 1996;11:1657-60.
- Junor BJ. Continuing medical education for nephrologists in Europe. *Nephrol Dial Transplant* 1999;14:2099-100.
- Sociedad Española de Nefrología. El libro blanco de la Nefrología española (III). *Nefrología* 2000;20:396-402.
- Bernis Carro C; Comisión Nacional de la Especialidad de Nefrología en España. Trends in resident positions offered in nephrology (1985-2008). *Nefrología* 2011;31:155-61.