

Editorial

Performance of Diagnostic and Interventional Nephrology in Spain[☆]

Situación de la nefrología diagnóstica e intervencionista en España

Haridian Sosa Barrios^a, José Ibeas López^b, Ramón Roca Tey^c,
Manuel Ceballos Guerrero^d, Angels Betriu Bars^e, Ignacio Cornago Delgado^f,
Manuel Lanuza Luengo^g, Vicente Paraíso Cuevas^h, Pedro L. Quirós Gangaⁱ,
Maite E. Rivera Gorrín^{a,*}, on behalf of the Nephrology and Interventionist Group (GNDI)
of the SEN

^a Nefrología, Hospital Universitario Ramón y Cajal, Madrid, Spain

^b Nefrología, Parc Taulí Hospital Universitari, Institut d'Investigació i Innovació Parc Taulí I3PT, Universitat Autònoma de Barcelona, Sabadell, Barcelona, Spain

^c Nefrología, Hospital de Mollet, Mollet del Vallès, Barcelona, Spain

^d Nefrología, Hospital Puerta del Mar, Cádiz, Spain

^e Nefrología, Hospital Arnau de Vilanova, Lleida, Spain

^f Nefrología, Hospital Galdakano, Bilbao, Vizcaya, Spain

^g Nefrología, Hospital Virgen de la Arrixaca, Murcia, Spain

^h Nefrología, Hospital del Henares, Coslada, Madrid, Spain

ⁱ Nefrología, Hospital Puerto Real, Puerto Real, Cádiz, Spain

According to the American Society of Diagnostic and Interventional Nephrology, Diagnostic and Interventional Nephrology (DIN) is defined as the application of imaging techniques and interventionism in the field of Nephrology in order to improve the management and care of patients with kidney disease.¹

DIN was originally developed by nephrologists as part of the search for solutions in light of the requirements and difficulties encountered during normal clinical practice, both on a diagnostic and treatment level²⁻⁴; the nephrologists were shaping and developing DIN, for example, by designing catheters for hemodialysis. Furthermore, ultrasound is being

more widely used in medicine, proving its great benefit in the management of kidney patients since the 1990s.^{5,6} Currently, the majority of specialities (medical and surgical), have incorporated ultrasound into their normal clinical practice and they perform specific interventions within their speciality.^{7,8} This situation has not arisen in our speciality, despite the fact that the main DIN milestones were led by nephrologists. In recent decades, this field has remained neglected, with the majority of our procedures being performed by other specialists and it is losing ground as an area of interest in Nephrology. At the healthcare level, there is an impact on other specialities, such

DOI of original article:

<https://doi.org/10.1016/j.nefro.2017.11.019>.

[☆] Please cite this article as: Sosa Barrios H, Ibeas López J, Roca Tey R, Ceballos Guerrero M, Betriu Bars A, Cornago Delgado I, et al. Situación de la nefrología diagnóstica e intervencionista en España. *Nefrología*. 2018;38:459-462.

* Corresponding author.

E-mail addresses: maiteelizabeth.rivera@salud.madrid.org, mriverago@gmail.com (M.E. Rivera Gorrín).

2013-2514/© 2018 Sociedad Española de Nefrología. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

as Radiology and Vascular Surgery, which have incorporated these procedures into their service portfolios, thus increasing their workload and making difficult the diligent management of kidney patients.

There is currently some controversy between those who believe that the performance of these techniques by the nephrologist is intrusive and has no value in the training of resident doctors,⁹ and those who think, like us, that they should be performed by the nephrologist, since it provides greater autonomy, they are performed faster and improve the patient management.¹⁰ Unfortunately, only few centres had a record of the procedures performed, the medical professionals do not receive specific training in the various techniques, and there is no official exam or certification to evaluate the proficiency of the nephrologists in the performance of such procedures.^{11,12}

From our point of view, the development of a DIN section within Nephrology is highly efficient and economically feasible; it reduces the time waiting for the procedure and optimises resources, avoiding the overload of other departments, as has already been demonstrated in previous publications.¹³⁻¹⁹ Furthermore, the incorporation of DIN impacts on decision-making and on the viability and the survival of accesses for renal replacement therapy.²⁰

As it is an area where the boundaries are blurred with other specialties, we believe that the implementation of a DIN programme should be planned, gradually implemented and agreed upon with the other departments involved, whenever possible, thus enabling knowledge sharing²¹ and avoiding disputes. Furthermore, access to specific training should be ensured for all nephrologists interested in performing these techniques,^{11,13,22} by developing educational tools²³ and establishing normal clinical practice standards, as well as an assessment or certification that officially validates the doctors' capacity to perform diagnostic and interventional procedures.

Furthermore, the development of DIN would allow to recover clinical activities and prevent the progressive loss of diagnostic and therapeutic skills that may rely on other specialties. It would also potentiate health management processes and the continuity of inter-level healthcare, promote teaching and research, collaborate in the sustainability of the healthcare system and make the speciality more attractive, both for nephrologists and for specialists in training, an area awaiting improvement in recent years, as shown by the higher score numbers of resident choosing the medical speciality in Spain.²⁴ Finally, we must stress that these practices are included in the specialist Nephrology guideline²⁵ and they are an objective in the 2016-2020 strategic plan of the Spanish Society of Nephrology (SEN).²⁶

Based on the reasons exposed above., in 2014 the SEN approved the generation of Diagnostic and Interventional Nephrology Group (*Grupo de Nefrología diagnóstica e intervencionista, GNDI*)²⁷ aiming to promote the dissemination, establishment and development of DIN in Spain, and retrieve the role of the nephrologist in techniques specific to the speciality. This objective requires an increase in the number of trained nephrologists, the establishment of standards of performance and the certification of official training centres for interventional nephrologists in Spain.

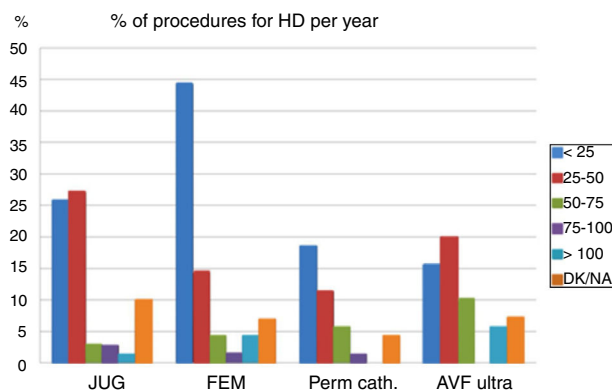


Fig. 1 – Annual volume of interventional procedures. All the techniques performed by the nephrologist using ultrasound guidance.

DK/NA: don't know/no answer; Fem.: temporary femoral catheter; Jug.: temporary jugular catheter; KT: kidney transplant; N: native kidney; Perm.: permanent tunnelled catheter.

As an initial project and with the purpose of both learning and dissemination about the situation of the Spanish DIN, the GNDI conducted a survey in 2015 via email on all the Nephrology departments in Spain through the SEN. The response rate to the survey was low (35.8%) but similar to the level of participation recorded in other countries,²⁸⁻³⁰ highlighting that less than 70% of the temporary catheter implantations for haemodialysis were echo-guided, despite being recommended by the official Spanish guidelines,^{31,32} and less than 30% of the departments performed diagnostic ultrasounds, with the arteriovenous fistula (AVF) ultrasound being the most widely used technique (65%). We can draw the conclusion that DIN in Spain is rare, limited mainly to (techniques performed >30%) to the canalisation of ultrasound-guided catheters, kidney biopsies and AVF ultrasounds for HD (Figs. 1 and 2). Although the interpretation of our results is limited by the lack of participation, it is still representative since we obtained responses from all the autonomous communities. Regarding its future implementation, 8.5% of the centres rejected the idea of incorporating DIN into their portfolio of services.

Other countries that have published their experience in this field show good clinical and technical results, a lower or similar complication rate to that existing in the literature, and an improvement in the patient's comprehensive care.^{12,28-30} As observed in our country the response rate in those countries in which the survey was conducted was equally low (10-37%), with the exception of the survey conducted by Berns and O'Neill¹² in the USA (68%). A high percentage of nephrologists from several countries referred to a lack of training in interventional and diagnostic techniques.

Compared with the level of DIN developed in the USA,¹² where the term DIN was coined, we observed that Spanish nephrologists performed fewer ultrasound-guided native kidney biopsies (42% vs. 35.8%), kidney transplants (51% vs. 46%), intervention for an AVF is anecdotal and the percentage of temporary accesses for ultrasound-guided haemodialysis is considerably lower (88.5% vs. 64%). On the other hand, in

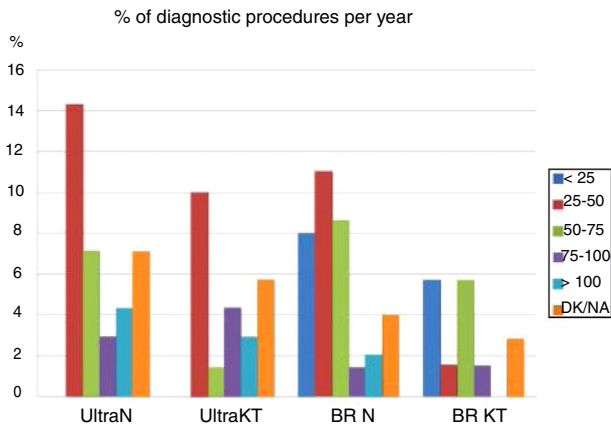


Fig. 2 – Annual volume of diagnostic procedures. All the techniques performed by the nephrologist using ultrasound guidance.

DK/NA: don't know/no answer; Fem.: temporary femoral catheter; Jug.: temporary jugular catheter; KT: kidney transplant; N: native kidney; Perm.: permanent tunnelled catheter.

Spain, the performance of diagnostic ultrasounds (NK: 8% vs. 2.6% and kidney transplants: 11% vs. 23%) and the insertion of peritoneal catheters by a nephrologist are more frequent (14% vs. 26%).

Ultimately, DIN provides professionals with greater autonomy, optimises existing resources and reduces waiting times, resulting in an improvement in the continuity of care of the kidney patient that is highly efficient and at a reduced cost. DIN in Spain is being expanded slowly. We encourage Nephrology departments to include DIN in their portfolio of services and we also encourage the residents to be trained in this new discipline, which is included in the speciality's training programme. Therefore it should be insured that all nephrologists are educated through the implementation of training programmes. Centres that provide this training must be accredited.

REFERENCES

- American Society of Diagnostic and Interventional Nephrology. Available from: <http://www.asdin.org/?page=61> [accessed 20.04.17].
- Iversen P, Brun C. Aspiration of the kidney. *Am J Med.* 1951;11:324-30.
- Quinton WE, Dillard DH, Scribner BH. Cannulation of blood vessels for prolonged hemodialysis. *Trans Am Soc Artif Intern Organs.* 1960;6:104-13.
- Shaldon S, Chiandussi L, Higgs B. Haemodialysis by percutaneous catheterization of the femoral artery and vein with regional heparinization. *Lancet.* 1961;II:857-9.
- Rivera Gorrin M. Incorporación de la ecografía a la práctica rutinaria del nefrólogo: nuestra experiencia. *Nefrología.* 1995;15:104-7.
- O'Neill WC. Renal ultrasonography: a procedure for nephrologists. *Am J Kidney Dis.* 1997;30:579-85.
- Lichtenstein D. Lung ultrasound in the critically ill. *Curr Opin Crit Care.* 2014;20:315-22.
- Topcuoglu MA. Transcranial Doppler ultrasound in neurovascular diseases: diagnostic and therapeutic aspects. *J Neurochem.* 2012;123:39-51.
- Negoianu D, Berns JS. Should nephrology training programs continue to train fellows in the placement of temporary hemodialysis catheters? *Semin Dial.* 2014;27:245-7.
- Rivera Gorrin M, Quereda C. Diagnostic and interventional nephrology: an opportunity for Spanish nephrologists. *Nefrología.* 2011;31:131-3.
- Sachdeva M, Ross DW, Shah HH. Renal ultrasound, catheter placement, and kidney biopsy experience of US Nephrology fellows. *Am J Kidney Dis.* 2016;68:187-92.
- Berns JS, O'Neill WC. Performance of procedures by nephrologists and Nephrology fellows at US Nephrology training programs. *Clin J Am Soc Nephrol.* 2008;3:941-7.
- Asif A, Byers P, Vieira CF, Roth D. Developing a comprehensive diagnostic and interventional nephrology program at an academic center. *Am J Kidney Dis.* 2003;42:229-33.
- Rasmussen RL. Establishing an interventional nephrology suite. *Semin Nephrol.* 2002;22:237-41.
- Beathard GA, Litchfield T. Effectiveness and safety of dialysis vascular access procedures performed by interventional nephrologists. *Kidney Int.* 2004;66:1622-32.
- Gadallah MF, Pervez A, el-Shahawy MA, Sorrells D, Zibari G, McDonald J, et al. Peritoneoscopic versus surgical placement of peritoneal dialysis catheters: a prospective randomized study on outcome. *Am J Kidney Dis.* 1999;33:118-22.
- García-Trío G, Alonso M, Saavedra J, Cigarrán S, Lamas JM. Gestión integral del acceso vascular por los nefrólogos. Resultado de 3 años de trabajo. *Nefrología.* 2007;27:335-9.
- Royo A, Garcia-Testal A, Soldevila A, Panadero J, Cruz JM. Tunnelled catheters. Complications during insertion. *Nefrología.* 2008;28:543-8.
- Ibrik AO, Samon Guasch R, Roca Tey R. Catéteres tunelizados para hemodiálisis tipo sistema Tesio de catéteres gemelos mediante técnica ecodirigida. Análisis retrospectivo de 210 catéteres. *Nefrología.* 2006;26:719-25.
- Asif A, Byers P, Gadalean F, Roth D. Peritoneal dialysis underutilization: the impact of an Interventional nephrology peritoneal dialysis access program. *Semin Dial.* 2003;16:266-71.
- Saad TF. Training, certification, and reimbursement for nephrology procedures. *Semin Nephrol.* 2002;22:276-85.
- Ritchie AG, Saunders J, Baer R, May S. A survey of current procedural practices of Australian and New Zealand nephrologists. *Semin Dial.* 2013;26:E50-3.
- Rivera Gorrin M, Correa Gorospe C, Burguera V, Ortiz Chercoles AI, Liaño F, Quereda C. Teaching innovations in ultrasound guided renal biopsy. *Nefrología.* 2016;36:1-4.
- Remón C, Quirós P, González-Outón J, del Castillo R, García Herrera AL, Sánchez Márquez MG. Recuperando actividad e ilusión: el hospital de día médico de nefrología. *Nefrología.* 2011;31:545-59.
- Programa formativo de la especialidad de Nefrología. BOE 223 del 15 de septiembre del 2008. Disponible en: <https://www.boe.es/boe/dias/2008/09/15/pdfs/A37790-37793.pdf> [consultado 20 May 2017].
- Plan estratégico de la Sociedad Española de Nefrología 2016-2020. Disponible en: <http://www.senefro.org/modules.php?name=webstructure&idwebstruct.ure=90> [consultado 20 May 2017].
- Rivera Gorrin M, Cornago Delgado I, Betriu Bars A, Lanuza Luengo M, Ceballos Guerrero M, Paraíso Cuevas V, et al. Creation of the Working Group on Diagnostic and

- Interventional Nephrology of the Spanish Society of Nephrology. *Nefrología*. 2016;36:325-6.
28. Sachdeva M, Ross DW, Shah HH. Renal ultrasound dialysis catheter placement, and kidney biopsy experience of US nephrology fellows. *Am J Kidney Dis*. 2016;68:187-92.
 29. Rope RW, Pivert KA, Parker MG, Sozio SM, Merell SB. Education in nephrology fellowship: a survey-based needs assessment. *J Am Soc Nephrol*. 2017;28:1983-90.
 30. Nascimento MM, Chula D, Campos R, Nascimento D, Riella MC. Interventional nephrology in Brazil: current and future status. *Semin Dial*. 2006;19:172-5.
 31. Guía clínica española del acceso vascular para hemodiálisis. *Nefrología*. 2017;37 Suppl. 1:1-177.
 32. Sociedad Española de Radiología. Documento «Qué no hacer». Disponible en: <http://seram.es/modules.php?name=documentos&op=getDocument&iddocument=397> [consultado 20 May 2017].