

# Learning curve in flexible cystoscopy in residents and urologists in Latin America.

## Curva de aprendizaje en cistoscopia flexible en residentes y urólogos de América Latina.

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**Summary:** Cystoscopy is essential in urology to diagnose bladder pathologies, especially cancer. Flexible cystoscopy offers certain advantages such as in-office availability. Learning this technique requires varying degrees of endoscopic skill. It is often assumed that procedural competence is achieved in the early years of urological training or within a limited number of procedures. Our objective in the present work was to know the learning curve in this technique among urologists in Latin America. For the study, a survey was conducted among urologists in Latin America, asking if they had received training during their residency and what their learning curve had been like. 83 colleagues participated in the study, including residents, recently graduated urologists and those with more than one year of experience. 70% felt competent to perform cystoscopies without supervision. 57% received training at their residence center. Regarding the learning curve, 86% of respondents reported self-perception of competence among the first 15 cystoscopies. The study included residents, urologists with more than one year of experience, and recent graduates. The availability of flexible cystoscopy during residency was higher for residents (77%) compared to experienced urologists. Most felt competent within 6-10 procedures. In the analysis of residency training, 74% of residents received it. When residents, recently graduated urologists and those with more than one year of experience are analyzed separately, generational differences are observed. Flexible cystoscopy is more common in new generations and training is also more widespread in them. The learning curve is short, with 86% achieving proficiency in 15 procedures.

**Keywords:** Flexible cystoscopy, learning curve, availability, urology residency.

**Resumen:** La cistoscopia es esencial en urología para diagnosticar patologías vesicales, especialmente el cáncer. La cistoscopia flexible ofrece ciertas ventajas como la disponibilidad en el consultorio. El aprendizaje de esta técnica requiere diversos grados de habilidad endoscópica. A menudo se asume que la competencia en el procedimiento se logra en los primeros años de formación urológica o dentro de un número limitado de procedimientos. Nuestro objetivo en el presente trabajo fue conocer la curva de aprendizaje en dicha técnica entre los urólogos de América Latina. Para el estudio se realizó una encuesta entre urólogos de Latinoamérica, donde se preguntaba si habían recibido capacitación durante su residencia y cómo había sido su curva de aprendizaje. En el estudio participaron 83 colegas, incluyendo residentes, urólogos recién graduados y aquellos con más de un año de experiencia. El 70% se sintió competente para realizar cistoscopias sin supervisión. El 57% recibió capacitación en su centro de residencia. En cuanto a la curva de aprendizaje un 86% de los encuestados refirieron la autopercepción de competencia entre las primeras 15 cistoscopias. El estudio incluyó a residentes, urólogos con más de un año de experiencia y recién graduados. La disponibilidad de cistoscopia flexible durante la residencia fue mayor para los residentes (77%) en comparación con los urólogos con experiencia. La mayoría se sintió competente entre los 6-10 procedimientos. En el análisis de capacitación en la residencia, el 74% de los residentes la recibió. Cuando se analizan por separado residentes, urólogos recién graduados y los que tienen más de un año de experiencia, se observan diferencias generacionales.

La cistoscopia flexible es más común en las nuevas generaciones y la capacitación también está más extendida en ellas. La curva de aprendizaje es corta, con un 86% alcanzando competencia en 15 procedimientos.

**Palabras clave:** Cistoscopia flexible, curva de aprendizaje, disponibilidad, residencia de urología.

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## 1. Introduction

Cystoscopy is a common procedure in urology, given its great usefulness for inspecting the bladder in search of multiple pathologies (1). Pathologies such as bladder cancer are currently increasing in incidence, which is why procedures such as cystoscopy are increasingly in demand (2). It is the *gold standard* for the study of hematuria, as well as in the follow-up of patients with bladder tumors, flexible cystoscopy presents certain advantages in this sense, lower morbidity and less pain (3). To this we must add that it is a study which can be performed in the office and on an outpatient basis. In terms of learning this technique, flexible cystoscopy involves multiple steps, each of which requires varying degrees of endoscopic skill. It is often assumed that procedural competence is achieved in the early years of urological training or within a limited number of procedures (4).

Regarding the number of flexible cystoscopies necessary to achieve competence in the technique, it is an aspect on which we find little published information, mainly in Latin America. In 2000, The British Association of Urological Surgeons (BAUS) recommended a minimum of 60 flexible cystoscopies under supervision in order to achieve technical competence in the procedure (2), although we must highlight this number seems arbitrary since the justification for this is not explained. In the same way, Schout refers the number to differentiate between experts and beginners in 50 procedures, a value to may be arbitrary (5). On the other hand, the British Association of Urological Nurses (BAUN) in 2012 stated that in 50 cystoscopies the competence to perform the complete procedure should be achieved, safely and with a correct evaluation of possible pathologies (6). In this study, states that 10 observations of the procedure should be carried out, 10 removals of the cystoscope for a correct evaluation of the urethra, 10 introductions of the same, 10 bladder explorations and another 10 complete procedures to reach the number of 50 procedures.

On the other hand, we have the self-perception of competence, which can vary widely from one urologist to another. This will depend on the individual's ability, their learning capacity, previous training, the number of variables they are exposed to during their learning curve, as well as the professional who is tutoring the procedures. Without failing to take into account that self-perception is highly subjective and can vary widely from one technician to another. Worldwide, simulation in medicine has evolved substantially in recent decades, with endourological procedures being no exception (7). These are useful in techniques that require a large number of procedures, to achieve a certain level of competence prior to practicing with patients (7-8). Despite the evidence in favor of the usefulness of simulators in learning cystoscopy, the absence of cost-effective tools for this practice results in the majority of training worldwide in flexible cystoscopy still being in patients (9). This is especially observed in Latin America where the use of simulators in this type of procedures is anecdotal.

Our objective in this study was to learn about the learning curve in this technique in residents and urologists in Latin America, as previously mentioned, the learning curve in patients, evaluating the self-perception of competence. Training during residency in this technique, and its availability in the different centers in Latin America.

## 2. Methods

For our study, we conducted a survey among different urology residents and urologists in Latin America. For this, we used a questionnaire on the Google Forms platform, in which they were asked the country where they had completed their residency, the year of residency they were currently studying (from 1st to 5th year) or years since the end of the residency (more or less than 1 year), availability of flexible cystoscopy (yes or no), number of cystoscopies performed to date (1 to 10, 11 to 20, 21 to 30, 31 to 50 or more than 50), and the most importantly, how many flexible cystoscopies had to be performed to perceive competence in the technique? Regarding this question, they were given the option to mark: between 1 and 5, between 6 and 10, between 11 and 15, between 16 and 20 or more than 20.

The self-perception of competence was specified taking into account the ability to correctly handle the flexible cystoscope and based on this to be able to perform a correct evaluation of the distal and proximal urethra, bladder neck, bladder trigone, urinary meatuses, and all bladder walls. Likewise, being able to do it while keeping urinary mucosal injuries to a minimum. The self-assessment was of the formative type, and therefore individual and qualitative.

The results of the study were reported using descriptive statistics. The variables were represented as percentages. The survey was distributed to groups of residents and urologists through common groups on social networks with colleagues from Latin America. Colleagues from Uruguay, Argentina, Chile, Ecuador, Dominican Republic, among others, participated in it. The survey was distributed on 8/1/2023 and closed on 8/31/23, a sample of at least 100 participants was expected, finally reaching the final number of 83.

## 3. Results

A total of 83 colleagues, including residents and urologists, with a recent specialty and more than a year of experience participated in the study. Most of them were from Uruguay (41%, n=34), followed by Argentina (30%, n=25). 10 colleagues from Ecuador, 3 from the Dominican Republic, 1 from Chile and 10 from other countries responded to the survey. 36% were residents, while 12 were recent specialists and 49% were specialists more than 1 year ago.

When asked if they had or had had the availability during their residency to use a flexible cystoscope, 66% responded yes. Regarding whether they had felt qualified to perform a cystoscopy without supervision, 70% responded affirmatively. Of those who responded affirmatively, 20 achieved the self-perception of technical competence by performing between 6 and 10 cystoscopies, 16 achieved it by performing between 1-5, 14 between 11-15, 1 between 16-20 and 7 needed more than 20 procedures to achieve the competence; These results are represented in Figure 1.

When asked if the center where they were or had completed their residency provided them with training in the management of flexible cystoscopy, 57% said yes, while the remaining 43% reported having had to train at another center outside of the residency.



**Figure 1.** Number of procedures performed to reach auto-competence.

We highlight at this point that among residents and urologists with a specialty of less than one year, 74% had had training during residency. While among urologists with more than 1 year, 61% had to train outside residency. If we analyze among the residents only, of the total of 30 residents, 9 did not feel qualified to perform a cystoscopy, of these 7 were 3rd and 4th year residents. None of these reported having had the possibility of training in the technique during their residency. Finally, they were asked if they had this tool in the office, with 53% answering yes, while the remaining 47% responded negatively.

#### 4. Discussion

When we analyze the availability of flexible cystoscopy during residency in the different groups, we see that 77% of the residents who participated in the study currently have access to this instrument. While 54% of urologists received more than 1 year ago had this tool available. Kavoussi et al. (10) in 1988 already described that 10% of urologists were familiar with flexible cystoscopy, so it is not surprising that the younger generations are the ones who have this technique most incorporated.

Regarding the learning curve of the procedure, we observed that the majority (34.5%) reported their self-perception of technical competence by performing between 6-10 cystoscopies, followed by 27.5% between 1-5 cystoscopies, 24% between 11-15, 12% over 20 and finally only 2% between 16-20. While authors such as Vallancien et al (11) in 1986 report that after a brief training (how much was not specified) flexible cystoscopy could allow us an equally sensitive exploration of the bladder as rigid cystoscopy, other authors such as The British Association of Urological Surgeons (2) recommends a minimum of 60 flexible cystoscopies under supervision in order to achieve technical competence in the procedure, as well as the BAUN in 2012, which established the number at 50 procedures, this being also carried out in stages (6).

The BAUN establishes a series of steps and goals that are completed by a tutor while the technique is performed. Regarding this topic, Brunckhorst et al refer that the tutor is the most important aspect with regard to learning a technique within urology (12), as well as the importance of carrying out learning by modules, with clear goals to achieve in each module. It may be that the lack of these protocols, and of clear goals, added to the fact that

our study measures a highly subjective aspect such as self-perception of competence, is the cause of the great difference in the numbers, potentially leading our subjects to a “ false sense of competition.” On the other hand, we must highlight that it is a procedure with which residents are increasingly familiar, as well as generations that have this equipment available from the early stages of their career, which can provide a certain advantage when learning the procedure. procedure.

When analyzing whether the center where they had completed their residency provided them with training in the use of the technique, we found that 74% of the residents had obtained training in the technique in their place of residence, a percentage that is maintained if we include those recently specialists in this group. On the other hand, among urologists with more experience, only 39% received this training in their residency, this number probably becoming smaller the more years have passed since the completion of their training.

Finally, we analyzed the availability of flexible cystoscopy in the office, finding that 53% of respondents have this tool in their office, although we do not have numbers from other series to compare these statistics.

We must highlight as limitations of the study the fact of presenting a low number of observations and mainly the analysis of a highly subjective variable such as the self-perception of competence in flexible cystoscopy, subject to biases, in the same way we believe it is a limitation of the study. have similar series to be able to compare results.

## 5. Conclusions

- A generation gap is evident between specialist urologists with more than one year of experience and residents, with flexible cystoscopy being a widely more widespread technique in new generations.
- The majority of residents in Latin America are trained as part of their residency today compared to previous generations.
- The learning curve is relatively short, reaching 86% proficiency among the first 15 cystoscopies.

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