



## ORIGINAL ARTICLE

# Development and validation of a training and assessment tool for laparoscopic radical nephrectomy<sup>☆</sup>



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### KEYWORDS

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### Abstract

**Introduction:** Laparoscopic radical nephrectomy (LRN) is a cornerstone in managing renal cancer and small renal masses. Twenty-first century surgical training faces challenges, thus must be efficient and safe so surgeons attain relevant skills, protecting patients and operative outcomes. This study aimed to systematically develop a tool for training and assessment in LRN and validate the developed tool for use by trainee urologists.

**Methods:** This prospective, longitudinal, multi-institutional study was undertaken from September 2014–June 2015. Healthcare Failure Mode and Effect Analysis was utilized for development and followed by validation where the assessment tool was distributed to five specialists to increase content validity. Four experts were observed as a multi-institutional approach. Hand-assisted, transperitoneal and retroperitoneal approaches were considered.

**Results:** The LRN Assessment Tool comprised four phases, 17 processes, 41 sub-processes. Four surgeons and operating teams were observed across four hospitals for 19.5 h (5.75 h hand-assisted, 8.75 h trans-peritoneal, 5 h retro-peritoneal). After hazard analysis, three checklists were constructed. Those for hand-assisted LRN and transperitoneal LRN contained four phases, 20 processes, 33 sub-processes and that for retroperitoneal LRN contained four phases, 20

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**PALABRAS CLAVE**

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processes, 30 sub-processes. These were merged to form one assessment tool. The final result was a four phase LRN Assessment Tool with 17 processes, 41 sub-processes. All participants agreed the final LRN Assessment Tool included pertinent steps.

**Conclusions:** The LRN Assessment Tool was developed using Healthcare Failure Mode and Effect Analysis risk analysis to ensure hazardous procedural sub-steps were included. Validation ascertained important processes were not overlooked. Full application through a pilot study must be undertaken.

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## Desarrollo y validación de una herramienta de entrenamiento y evaluación para la nefrectomía radical laparoscópica

### Resumen

**Introducción:** La nefrectomía radical laparoscópica (NRL) es un pilar en el tratamiento del cáncer renal y las pequeñas masas renales. El entrenamiento quirúrgico del siglo XXI enfrenta desafíos, por lo tanto debe ser eficiente y seguro para que los cirujanos logren habilidades relevantes, protegiendo a los pacientes y los resultados operativos. Este estudio tuvo como objetivo desarrollar sistemáticamente una herramienta para capacitación y evaluación en NRL y validar la herramienta desarrollada para su uso por los urólogos en formación.

**Métodos:** Este estudio prospectivo, longitudinal y multiinstitucional se realizó entre septiembre de 2014 y junio de 2015. Se utilizó el Análisis Modal de Fallos y Efectos de Salud para el desarrollo y luego se validó, donde la herramienta de evaluación se distribuyó a cinco especialistas para aumentar la validez del contenido. Cuatro expertos fueron observados como un enfoque multiinstitucional. Se consideraron los abordajes asistidos por la mano, transperitoneales y retroperitoneales.

**Resultados:** La herramienta de evaluación NRL constó de cuatro fases, 17 procesos, 41 sub-procesos. Se observaron cuatro cirujanos y equipos operativos en cuatro hospitales durante 19,5 h (5,75 h asistidas por la mano, 8,75 h transperitoneales, 5 h retroperitoneales). Después del análisis de riesgos, se construyeron tres listas de verificación. Las de NRL asistida manualmente y NRL transperitoneal contenían cuatro fases, 20 procesos, 33 subprocesos y la de NRL retroperitoneal contenía cuatro fases, 20 procesos, 30 subprocesos. Estos se fusionaron para formar una herramienta de evaluación. El resultado final fue una herramienta de evaluación de NRL de cuatro fases con 17 procesos, 41 subprocesos. Todos los participantes estuvieron de acuerdo en que la herramienta final de evaluación de NRL incluía los pasos pertinentes.

**Conclusiones:** La herramienta de evaluación de NRL se desarrolló utilizando el análisis de riesgos Análisis Modal de Fallos y Efectos de Salud para garantizar que se incluyan los sub-pasos de procedimientos peligrosos. La validación aseguró que los procesos importantes no fueron pasados por alto. Se debe llevar a cabo una aplicación completa a través de un estudio piloto.

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## Introduction

Laparoscopic radical nephrectomy (LRN) remains a cornerstone in the management of renal tumours and small renal masses where nephron sparing surgery is not possible.<sup>1</sup> Outcomes are comparable to those of open radical nephrectomy and it is more cost effective than open or robot-assisted methods.<sup>2,3</sup> Thus, LRN is an important procedure to master in order that the benefits of the minimally invasive technique is maximized.

Modern surgical training faces numerous challenges. There has been a rise in the prevalence of litigation against urologists and an increased awareness of factors affecting

patient safety within the operating room.<sup>4-6</sup> Yet although the importance of safe practice and good outcomes is being increasingly recognized, surgeons face reduced training opportunities. Measures including the European Working Time Directive have lessened the hours doctors are to work.<sup>7</sup> Improved diagnostic technologies, surveillance, and alternative treatments mean that pathologies are identified at an earlier stage and fewer patients require the major surgery that was once the norm. Nonetheless, there is still the expectation to attain equal, if not greater, levels of competence through surgical training.

As a consequence of the aforementioned changes, training must be effective and safe, so that surgeons attain

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