

# Effectiveness of Video-Based Learning in Teaching Clinical Reasoning for Cubital Tunnel Surgeries

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## Introduction

In 2010, the National Academy of Medicine identified major flaws in the current approach to continuing medical education (CME) in the United States.

Recommendations to promote continuing professional development included:

1. Self-directed and just-in-time learning
2. Use of validated learning theories to develop teaching resources
3. Evaluation of the impact of teaching resources on clinical practice
4. Strategies to control costs of continuing education

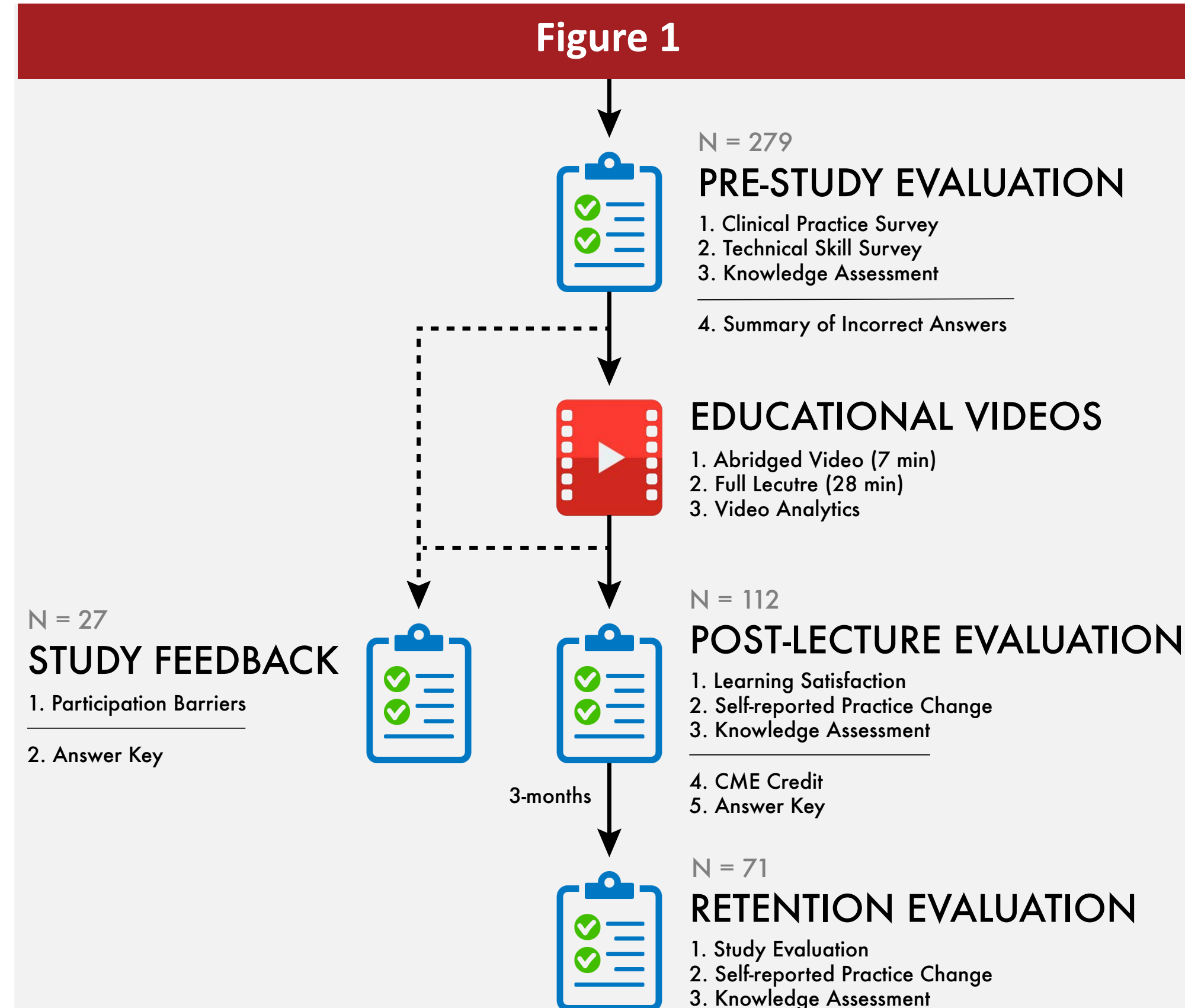
Accordingly, the aims of this study were to **determine the effectiveness of an online video-based learning module** in teaching management of cubital tunnel syndrome and to **evaluate the acceptability of the module among practicing surgeons**.

## Methods

An online module (**Figure 1**) was developed to teach surgeons an evidence-based algorithm for diagnosis and management of ulnar neuropathy from cubital tunnel syndrome (**Figure 2**).

Module design was guided by the cognitive theory of multimedia learning (CTML) and spatial learning concepts.

Longitudinal knowledge evaluations and practice surveys evaluated module usage and impact.



## Results

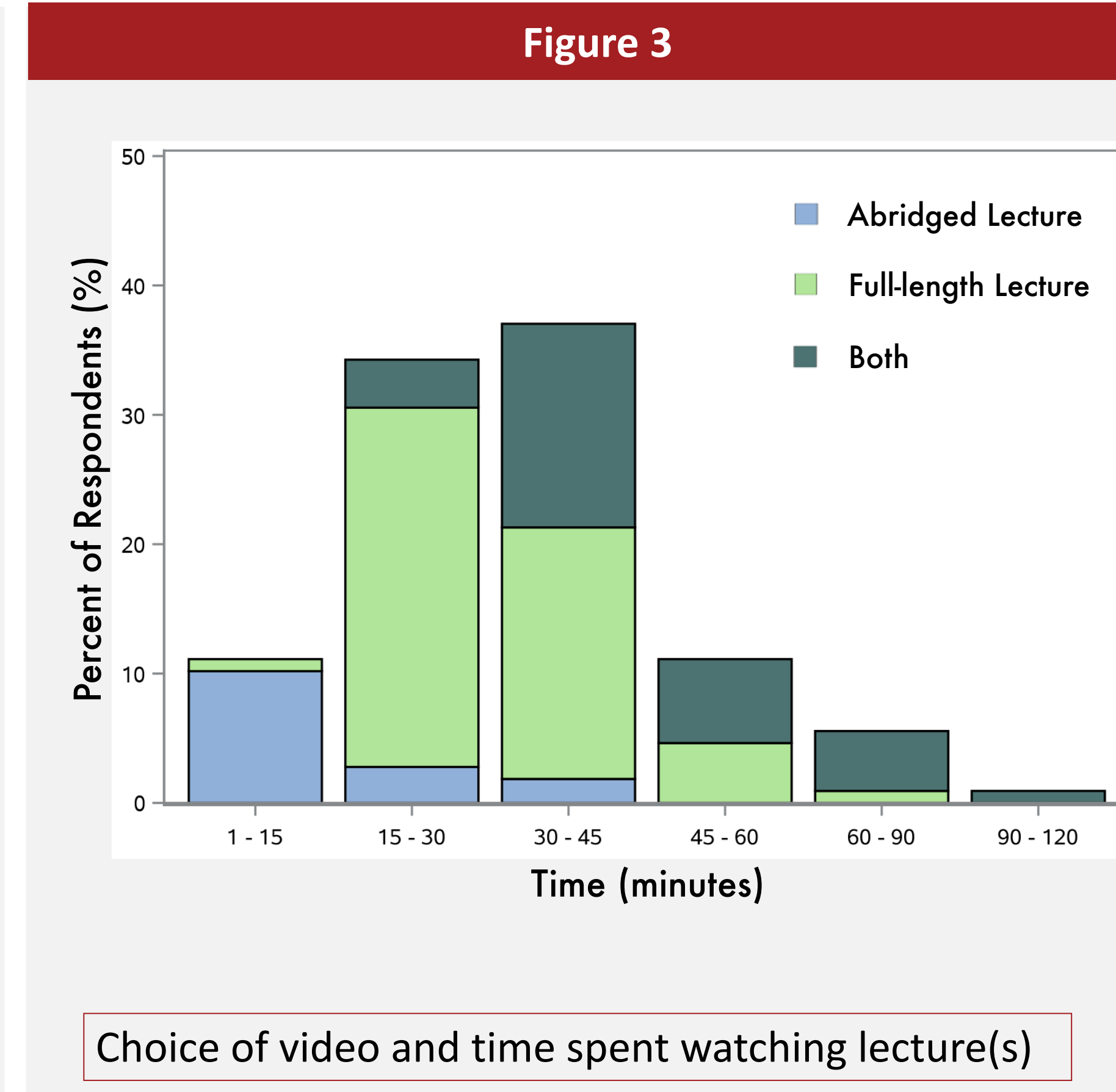
279 surgeons participated in the educational module (75% practicing surgeons, 42% in academic practice).

Most surgeons spent at least 30 minutes watching the lecture(s) (**Figure 3**).

Improvements in pre-lecture to post-lecture assessment scores are listed in **Table 1**. Median pre vs post-lecture score 5/10 vs 9/10.

Improvements in assessment scores were maintained 3 months after module completion.

- 30% re-watched the lectures
- 68% endorsed practice change
- 76% preferred online media to conference lectures

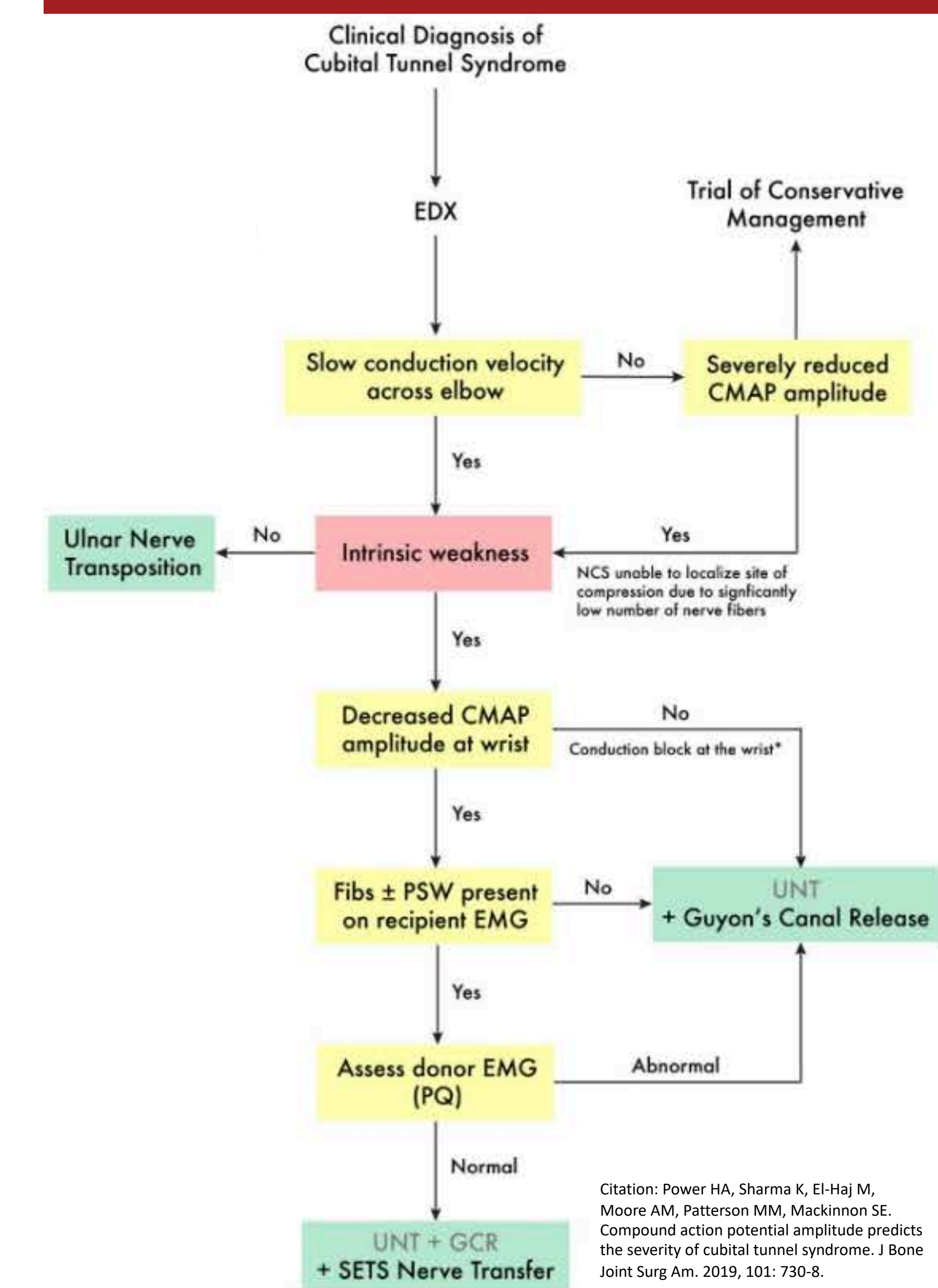


**Table 1: Improvements in knowledge assessment scores**

Questions	Percent Answered Correctly* (%)		
	Pre-lecture	Post-lecture	p-value†
Electrodiagnostic Subsection			
EDX indication for localization of nerve injury	70	98	<0.0001
EDX indication for severity of nerve injury	32	90	<0.0001
EDX indication for receptivity of motor endplates	57	97	<0.0001
Identification of conduction block	23	68	<0.0001
Supercharge End-to-side (SETS) Nerve Transfer Subsection			
Correct patient selection for SETS nerve transfer	14	67	<0.0001
Requirements for SETS Nerve Transfer:			
A. Weak intrinsic muscles: required	74	97	0.0002
B. Reduced CMAP amplitude at the elbow: not required	45	84	<0.0001
C. Reduced CMAP amplitude at wrist: required	55	91	<0.0001
D. Fibrillations and positive sharp waves in intrinsic muscles: required	72	98	<0.0001
E. Normal donor nerve: required	98	100	1.00

\* Among participants who responded in both the pre- and post-lecture assessments  
† Bonferroni adjusted p-values

**Figure 2**



Citation: Power HA, Sharma K, El-Haj M, Moore AM, Patterson MM, Mackinnon SE. Compound action potential amplitude predicts the severity of cubital tunnel syndrome. J Bone Joint Surg Am. 2019; 101: 730-8.

## Conclusions

An online lecture module, developed using evidence-based principles of multimedia learning, is an acceptable, reusable, and effective tool for continuing surgical education.

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