



Original article

## The Script Concordance Test in anesthesiology: Validation of a new tool for assessing clinical reasoning



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### ABSTRACT

**Objective:** To evaluate whether the Script Concordance Test (SCT) can discriminate between levels of experience among anesthesiology residents and attending physicians.

**Study type:** Multicenter (Toulouse, Nantes, Bordeaux and Limoges), prospective, observational study.

**Patients and methods:** A SCT made of 60 items was used to evaluate “junior residents” ( $n = 60$ ), “senior residents” ( $n = 47$ ) and expert anesthesiologists ( $n = 10$ ).

**Results:** There were no missing data in our study. Mean scores ( $\pm$ SD) were 69.9 ( $\pm$ 6.1), 73.1 ( $\pm$ 6.5) and 82.0 ( $\pm$ 3.5) out of a potential score of 100 for “junior residents”, “senior residents” and expert anesthesiologists, respectively. Results were statistically different between the 3 groups ( $P = 0.001$ ) using the Kruskal-Wallis test. The Cronbach's  $\alpha$  score was 0.63.

**Conclusions:** The SCT is a valid and useful tool for discriminating between anesthesia providers with varying levels of experience in anesthesiology. It may be a useful tool for documenting the progression of reasoning during anesthesia residency.

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### 1. Introduction

Initial medical training aims at giving students the professional competence that will enable them to practice their specialty. Although a sound knowledge base is essential, it represents only the foundation upon which successful clinical reasoning is built. It is well documented that clinical expertise is acquired by learning techniques such as examination skills or the completion of technical procedures, which trigger diagnostic or treatment responses [1–3]. Successful clinical reasoning thus depends on the ability to organize various pieces of information from multiple data sets [1–3].

The Script Concordance Test (SCT) was developed over the last 20 years in order to evaluate clinical reasoning [1–5]. Script theory asserts that experienced practitioners have developed networks of

knowledge, specifically in the performance of routine care, called illness scripts [4,5]. Networks of these scripts are made of links between knowledge of the disease, clinical symptoms, possible complications and relevant treatment [6].

The Script Concordance Test has been validated as a tool for separating groups of participants with varying degrees of clinical expertise in gynecology [7], urology [8], internal medicine [9], radiotherapy [10], neurology [5], as well as in nursing education [11].

While Multiple Choice Questions (MCQ) and/or Open Short Answer Questions (OSAQ), commonly used in validation exams for anesthesiology courses, can evaluate knowledge that was acquired during residency training, these methods mainly estimate factual knowledge and do not assess networks of knowledge and clinical reasoning. To date, SCTs have never been used to assess anesthesiologists.

The purpose of our study was to evaluate the validity of the SCT as a tool for assessing clinical reasoning in anesthesiology and to discriminate between groups of anesthesia residents and practitioners with varying levels of clinical experience.

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## 2. Material and methods

### 2.1. Test design

The anesthesiology Script Concordance Test included 20 cases, presented as small vignettes from common tasks performed in several

different areas of anesthesiology (for example: elective surgery, emergencies, pediatrics, obstetrics, regional anesthesia, preoperative consultations, postoperative analgesia, or management of perioperative coronary ischemia). There was no question about Intensive Care in the SCT. Each vignette (several lines long) described a specific clinical case or task, though sometimes incompletely (Fig. 1).

## Vignette 8

You support a 28 years-old man in the emergency room. He presents a closed fracture of the right leg.

If you think about...	And you discover...	Hypothesis become...
Perform a regional anesthesia (femoral and sciatic nerves blocks)	Persistent paresthesia in the peroneal nerve territory	-2 Contraindicated -1 Less useful 0 Neither more or less usefull +1 More useful +2 Essential
Perform a regional anesthesia (spinal anesthesia)	A congenital lung dyspalsia with chronic respiratory failure	-2 Contraindicated -1 Less useful 0 Neither more or less usefull +1 More useful +2 Essential
Perform a general anesthesia	A Cormack score at 4	-2 Contraindicated -1 Less useful 0 Neither more or less usefull +1 More useful +2 Essential

Vignette 8		
You are caring for a 28 year old man in the emergency room. He presents a closed fracture of the right leg.		
If you think about...	And you discover...	The hypothesis becomes...
Performing regional anesthesia (femoral and sciatic nerve blocks)	Persistent paresthesia in the peroneal nerve territory	-2 Contraindicated -1 Less useful 0 Neither more or less useful +1 More useful +2 Essential
Performing regional anesthesia (spinal anesthesia)	A congenital lung dyspalsia with chronic respiratory failure	-2 Contraindicated -1 Less useful 0 Neither more or less useful
		+1 More useful +2 Essential
Performing general anesthesia	A Cormack score of 4	-2 Contraindicated -1 Less useful 0 Neither more or less useful +1 More useful +2 Essential

Fig. 1. Example of a clinical vignette with Script Concordance Test (SCT) items.

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