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Can I handle the scalpel? Different views on critical subtask assessment between residents and expert surgeons

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Introduction

- **Experts** have **two roles** once they entrust residents to 'handle the scalpel' in the operation theatre:
 - As a **teacher**: Allowing the resident to **progress to autonomous** task performance.
 - As an **expert**: Striving for the **best possible outcome** for the patient.
- **Residents** have **two goals** as **learners** in the operation theatre:
 - 'Handle the scalpel' **as long as possible**.
 - Elicit expert information** when their **expertise becomes insufficient**.
- **Complex or critical subtasks execution has an effect on** :
 - Experts**: **outcome** becomes **more important** than **teaching**.
 - Residents**: they need **teachers** even more to 'keep the scalpel' themselves.

Objective

What is the **complexity** of all the **different subtask** of a **single orthopaedic surgical procedure**:

a. According to the **experts**?

b. According to the **residents**?

Methods

- **56 subtasks** were identified in an **uncemented total hip replacement** procedure for osteoarthritis.
- 21 residents and 17 experts rated **how much attention they need for every subtask** of the procedure on a **5-point Likert scale**.
- **High attention sub tasks** were defined as a median attention score of **4 or more**.
- We asked the participants to provide **arguments for high attention scores**.

Results

- Both experts and residents expected to need **normal attention for the majority** of the subtasks.
- **Experts** had:
 - High attention scores on 12 subtasks** (table).
 - Frequent **Arguments**: '**Crucial for end result**', '**Essential for outcome**', '**Prevention of complications such as luxation**'.
- **Residents** had:
 - High attention scores on 8 subtasks** (table).
 - Frequent **Arguments**: '**Little room for error**', '**Is difficult**', '**Must be perfect**'.
- The **majority** of these **critical tasks** can be characterised as '**point of no return**' **judgment and decision making** (table).

table: High attention subtasks of experts and residents

	Subtask	Skill (predominantly)	Experts High attention	Residents High attention
1	Assessing angle and height of collum osteotomy femur	Judgement / Decision making	Yes	Yes
2	Exposing acetabulum with homan retractors / pins	Motor	Yes	
3	Reaming acetabulum in right angle and volume	Motor + Judgement / Decision making	Yes	Yes
4	Testing trial cup acetabulum and assess definite size	Judgement / Decision making	Yes	Yes
5	Insert cup acetabulum	Motor	Yes	Yes
6	Assessing cup position acetabulum	Judgement / Decision making	Yes	Yes
7	Assessing direction of broaching femur	Judgement / Decision making	Yes	
8	Assess position trial prosthesis and determine off set femur	Judgement / Decision making	Yes	Yes
9	Assessing definitive stem size femur	Judgement / Decision making	Yes	
10	Definitive stem placement femur	Motor	Yes	
11	Assessing definitive stem position and anteversion angle	Judgement / Decision making	Yes	Yes
12	Assessing definitive position, stability and length uncemented	Judgement / Decision making	Yes	Yes
	Total		12	8

Conclusion and discussion:

- **Experts' high attention** for subtasks was different from **residents'**:
 - Experts**: effects on patient **outcome and complications**.
 - Residents**: more **anxious** about their own **task performance**.
- **Critical subtasks** are characterised by **judgment and decision making** as key competences.
- **Experts and residents** might both **benefit** when they **identify and discuss critical and complex subtasks before** going into the operation theatre, because:
 - Experts as teachers** can adapt their guiding strategies to the residents' needs.
 - Residents as learners** need to appreciate when the focus of experts shifts towards patient outcome rather than to teaching.