

# ONE THING AT A TIME! THE EFFECT OF REPETITIVE INTERRUPTION ON A SURGEON'S DEXTERITY, COGNITIVE FUNCTIONING, AND WELLBEING

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# DISCLOSURES

» none

# INTRODUCTION

- » Neurosurgeons must maintain unparalleled concentration in the operating room in order to avoid potentially disastrous complications and to see a procedure through effectively and efficiently.
- » Neurosurgeons are routinely subjected, however, barrages of clinical and administrative questions, simple and complex, while operating.
- » There is very little literature about the impact of such activity on a surgeon's professional function and wellbeing.
- » We evaluated the impact of frequent interruptions on a surgeon's dexterity, cognitive functioning, and mood.

# METHODS

- » We evaluated the dexterity, cognition, and mood of 20 subjects, while subjects were involved in various fine motor tasks.
- » We then repeated the testing while subjecting the participants to two separate batteries of questions in an attempt to simulate the effects of a busy day of fielding calls and questions by a surgeon engaged in an operative procedure.
- » The first battery involved simple questions that could be answered reflexively.
- » The second involved questions that required higher processing.
- » We employed the Motor Performance Series to assess fine motor dexterity, well-validated paper-pencil neuropsychological tests to assess cognitive abilities, and the Profile of Mood States to evaluate for impact on mental well-being.

# RESULTS

- » Fine motor testing demonstrated that distraction resulted in substantial decrements in multiple measures of dexterity.
- » Reflexive questioning negatively impacted performance during tests for steadiness ( $p=0.014$ ), precision ( $p=0.02$ ), and information processing ( $p=0.029$ ).
- » Complex questioning caused a significant decline in steadiness ( $p=0.0007$ ), precision ( $p=0.03$ ), coordination ( $p=0.023$ ), and information processing ( $p=0.0003$ ).

# RESULTS CTD.

- » Neuropsychological testing showed that distraction resulted in considerable decline in verbal and visual memory, complex attention, mental flexibility, and psychomotor speed.
- » Reflexive questioning resulted in poorer performance during Brief Visuospatial Memory Test ( $p < 0.0001$ ), Trail Making Test ( $p = 0.0003$ ), and Symbol Digit Modality Test ( $p < 0.001$ ).
- » Complex questions resulted in poorer performance during Hopkins Verbal Learning for immediate ( $p = 0.02$ ) and delayed memory ( $p = 0.019$ ), Brief Visuospatial Memory Test ( $p < 0.0001$ ), Trail Making Test ( $p < 0.001$ ), and Symbol Digit Modality Test ( $p < 0.001$ ).

# RESULTS CTD.

- » The Profile of Mood States showed a decrease in feelings of vigor with both reflexive ( $p=0.001$ ) and complex questioning ( $p=0.0004$ ) but no change in feelings of anger, confusion, depression, fatigue, tension, or total mood disturbance

# DISCUSSION

- » This study demonstrated that a surgeon's performance (dexterity and cognitive processing) may be significantly affected by repetitive interruption.
- » Even simple questions requiring reflexive answering (such as inquiries about sutures to be employed, or laxatives for floor patients) may decrement a surgeon's function.
- » Complex questions requiring higher processing (e.g. ICU patient care questions, or new patient consultations) may be particularly disruptive.
- » What is more, all forms of interruptions affect mood, and might therefore erode resilience and contribute to burnout.

# SUMMARY POINTS

- » We believe that these results suggest that the barrage of questions commonly put upon operating neurosurgeons, are an unacceptable distraction from the task at hand and may result in decrements in surgeon fine motor performance, cognitive processing, and mood.
- » Every effort should be made to provide an operative environment free of distraction to optimize patient safety and maximize outcome.
- » Interruptions of any kind should be held to a minimum while the surgeon is engaged in an operative procedure.
- » Results might be generalized to all physicians involved in complex cognitive and technical functions.