

# Conquering fear during a Neurosurgical Emergency

Giovana Klefti<sup>1</sup> and Chadrakaseran Kaliaperumal<sup>1</sup>

<sup>1</sup>Affiliation not available

May 1, 2021

## Abstract

At present, no research work has been done on the immediate cognitive reappraisal mechanisms that allow emotion regulation during an intra-operative emergency. This letter discusses the importance of cognitive re-appraisal mechanisms in the regulation of fear during Neurosurgical emergencies.

Conquering fear during a Neurosurgical Emergency

Klefti Giovana, Kaliaperumal Chandrasekaran

## Correspondence

Dr Giovana Klefti

giovana.klefti@nhslothian.scot.nhs.uk

## Institution

Department of Clinical Neurosciences

Royal Infirmary of Edinburgh

50 Little France Cres

Edinburgh

EH16 4SA

Scotland

Key words- Neurosurgery; emergency; emotion regulation

Summary of conflicts of interest: none for authors

Funding: no external funding

Conquering fear during a Neurosurgical emergency

Key words: intra-operative emergency; emotion regulation

Evidence on the impact of emotion regulation on patient safety in acute situations is focused on work done in the context of the emergency department <sup>1,2</sup>. On the other hand, research in Neurosurgery has primarily been concerned with the longer-term effects of stress on physical and mental health <sup>3</sup>. At present, no research work has been done on the immediate cognitive reappraisal mechanisms that allow emotion regulation during an intra-operative emergency.

Fear is an important survival mechanism in response to an immediate threat to homeostasis <sup>4</sup>. The ‘predictive brain model’ describes how the brain functions as a homeostatic organ by processing information through a

‘bottom-up’ channel which carries sensory input from lower to higher brain areas and vice-versa a ‘top-down’ channel which relays our predictions<sup>5</sup>. Emotions such as fear during an emergency are triggered due to the inherent properties of the stimulus (‘bottom-up’) and/or the cognitive appraisal of the event (‘top-down’). An important and highly effective mechanism of fear regulation is reframing an event into less emotional terms to reduce its negative impact<sup>6</sup>.

In the opening of his book ‘Into the Magic Shop’, Neurosurgeon James Doty describes a case of life-threatening haemorrhage during the resection of medulloblastoma in a four-year old boy<sup>7</sup>. While the anaesthetist was performing chest compressions, Dr Doty was trying to clump a teared vein in the posterior fossa. In that time-critical moment he used meditation and visualisation of the teared vein to successfully control the haemorrhage. Dr Doty passes on the wisdom on the use of breathing techniques, repetition of mantras and visualisation to achieve his goals.

In a parallel case, Dr Mark McLaughlin gives an account of the first posterior-fossa tumour resection he performed unsupervised<sup>8</sup>. He proposes the use of ‘cognitive dominance’ to control negative thinking patterns prior important operations. This is defined as ‘the situational awareness that facilitates rapid and accurate decision-making under stressful conditions and limited decision-making time’<sup>8</sup>. Dr McLaughlin describes the ‘unexpected’ as the fire triggering the ‘fear fire alarm’. He advises people to dissect the unexpected event into an objective and a subjective component. The focus on solving the problem at hand rather than our emotional reaction to it is what he suggests releases us from fear. He also proposes reframing the unexpected from an obstacle into an opportunity<sup>8</sup>.

The above auto-biographical accounts offer insight into adaptive cognitive mechanisms during intra-operative emergencies learned through years of experience. This knowledge can guide younger trainees in identifying and refining their own coping skills. Developing the ability to observe one’s own thoughts in-itself offers a degree of emotional detachment that allows clarity of thought in highly stressful settings.

The role of metacognition, or ‘thinking about thinking’, is now increasingly recognised in medical education as an important aspect of self-regulated and lifelong learning. Further research into this area would be beneficial not only at the level of the individual, but also at the level of developing training programmes that ensure trainees are adequately equipped to deal with the unexpected.

#### References:

1. Sand M, Hessam S, Sand D, Bechara FG, Vorstius C, Bromba M, Stockfleth E, Shiue I. Stress-coping styles of 459 emergency care physicians in Germany : A pilot study. *Anaesthetist*. 2016 Nov;65(11):841-846. English. doi: 10.1007/s00101-016-0228-6. Epub 2016 Oct 14. PMID: 27742969.
2. Isbell LM, Boudreaux ED, Chimowitz H, Liu G, Cyr E, Kimball E. What do emergency department physicians and nurses feel? A qualitative study of emotions, triggers, regulation strategies, and effects on patient care. *BMJ Qual Saf*. 2020 Oct;29(10):1-2. doi: 10.1136/bmjqs-2019-010179. Epub 2020 Jan 15. PMID: 31941799; PMCID: PMC7363518.
3. Zaed I, Jaaidane Y, Chibbaro S, Tinterri B. Burnout Among Neurosurgeons and Residents in Neurosurgery: A Systematic Review and Meta-Analysis of the Literature. *World Neurosurg*. 2020;143:e529-e534. doi:10.1016/j.wneu.2020.08.005
4. Cannon W B. *The wisdom of the body*. New York: Norton, 1932
5. Clark A. Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behav Brain Sci*. 2013 Jun;36(3):181-204. doi: 10.1017/S0140525X12000477. Epub 2013 May 10. PMID: 23663408.
6. McRae K, Misra S, Prasad AK, Pereira SC, Gross JJ. Bottom-up and top-down emotion generation: implications for emotion regulation. *Soc Cogn Affect Neurosci*. 2012;7(3):253-262. doi:10.1093/scan/nsq103
7. Doty James R. *Into the Magic Shop: A Neurosurgeon’s Quest to Discover the Mysteries of the Brain and the Secrets of the Heart*. New York, Yellow Kite, Feb 2016
8. McLaughlin M, Coyne S, *Cognitive dominance: A Brain Surgeon’s Quest to Out-Think Fear*. New

York. Black Irish Entertainment, 5 Nov 2019