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# A portable mnemonic to facilitate checking for cognitive errors

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## Abstract

**Background:** Although a clinician may have the intention of carrying out strategies to reduce cognitive errors, this intention may not be realized especially under heavy workload situations or following a period of interruptions. Implementing strategies to reduce cognitive errors in clinical setting may be facilitated by a portable mnemonic in the form of a checklist.

**Methods:** A 2-stage approach using both qualitative and quantitative methods was used in the development and evaluation of a mnemonic checklist. In the development stage, a focus-driven literature search and a face-to-face discussion with a content expert in cognitive errors were carried out. Categories of cognitive errors addressed and represented in the checklist were identified. In the judgment stage, the face and content validity of the categories of cognitive errors represented in the checklist were determined. This was accomplished through coding responses of a panel of experts in cognitive errors.

**Results:** From the development stage, a preliminary version of the checklist in the form of four questions represented by four specific letters was developed. The letter 'T' in the TWED checklist stands for 'Threat' (i.e., 'is there any life or limb threat that I need to rule out in this patient?'), 'W' for 'Wrong/What else' (i.e., 'What if I am wrong? What else could it be?'), 'E' for 'evidences' (i.e., 'Do I have sufficient evidences to support or exclude this diagnosis?'), and 'D' for 'dispositional factors' (i.e., 'is there any dispositional factor that influence my decision'). In the judgment stage, the content validity of most categories of cognitive errors addressed in the checklist was rated highly in terms of their relevance and representativeness (with modified kappa values ranging from 0.65 to 1.0). Based on the coding of responses from seven experts, this checklist was shown to be sufficiently comprehensive to activate the implementation intention of checking cognitive errors.

**Conclusion:** The TWED checklist is a portable mnemonic checklist that can be used to activate implementation intentions for checking cognitive errors in clinical settings. While its mnemonic structure eases recall, its brevity makes it portable for quick application in every clinical case until it becomes habitual in daily clinical practice.

## Background

Striving to make an accurate diagnosis using sound clinical decision making skills is undoubtedly the goal of every clinician. In reality though, diagnostic error rates range from 5 to 15 % [1, 2]. Although the root causes of diagnostic errors are often multi-factorial, a large proportion of these errors have cognitive components [3, 4]. With sufficient training and experience, a clinician acquires a

large repertoire of illness representation models known as 'illness scripts' [5]. Illness scripts allow a clinician to make fast and accurate clinical decisions via pattern recognition [5–7]. However, while using pattern recognition results in accurate diagnoses most of the time [2, 8], there are occasions when such pattern recognition may derail the clinician into cognitive errors [9, 10] such as anchoring bias [11]. Anchoring bias occurs when the illness "pattern" recognized at the outset of the diagnostic process results in the clinician's fixation on this initial impression so much so that the clinician fails to adjust this initial impression even in the light of contradicting

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