

Review

# Functional Cognitive Disorders in the Emergency Department

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## Abstract

Functional neurological disorders may present with cognitive symptoms as functional cognitive disorders. This narrative review addresses the diagnosis and differential diagnosis of functional cognitive disorders encountered in the emergency department setting. Functional cognitive disorders, like other functional neurological disorders, can be clinically suspected and may be positively diagnosed in the emergency department setting following careful diagnostic evaluation, rather than being a diagnosis of exclusion. However, the differential diagnosis is broad, and the possibility of either stroke or seizure in particular needs to be considered. Functional cognitive disorders can be positively diagnosed in the emergency department setting, as for other forms of functional neurological disorder, and hence directed onward to appropriate services.

**Keywords:** functional cognitive disorders; functional neurological disorder; emergency department; diagnosis; differential diagnosis

## 1. Introduction

Functional neurological disorders (FND) have become a subject of increasing clinical and academic interest in recent years [1]. This interest has also extended to physicians working in emergency departments, in which setting the focus has been mostly on acute presentations of functional motor and/or sensory disorders [2,3], which often take the form of dissociative seizures resembling epilepsy or persistent weakness resembling a stroke [4].

FND may also present with cognitive symptoms as functional cognitive disorders (FCD) [5] or FND-cognitive subtype. As currently conceptualized, FCD is a heterogeneous construct encompassing various typologies, including mood disorder, other functional disorders, medication effects, dementia health anxiety, normal cognitive experience, functional (dissociative) amnesia, and malingering [5] (with most instances in clinical practice relating to memory symptoms [6]). This approach reminds one of Hughlings Jackson's distinction between two ways of investigating and classifying diseases, akin to the systems used respectively by botanists (i.e., scientific) and by gardeners (i.e., empirical), in that our current understanding of FCD is largely empirical. It seems highly unlikely that the scientific underpinnings of many of these typologies will be found to coincide, and indeed probably differ significantly from FCD understood as an FND-cognitive subtype (e.g., malingering, medication effects).

Although most FCD patients will be seen and diagnosed in outpatient clinics dedicated to memory or cognitive disorders, they may also be encountered in acute settings. However, no data on precise numbers of FCD patients presenting to emergency departments has been located. One recent study reported the proportions of FND symptom categories seen in a UK city hospital emer-

gency facility over an 8-month period to be: sensorimotor (44.5%), movement disorders (21%), functional seizures (15.5%) and "other" (e.g., speech, vision; 19%) [7]. The latter category might include examples of FCD. Numbers of "acute" presentations of FCD to the emergency department might also increase in the context of COVID infection and/or vaccination (as for other forms of FND), and specifically in the UK as a consequence of current difficulties in obtaining appointments in the primary care setting.

The objectives of this article are: to describe the diagnosis of FCD, to consider the neurological differential diagnosis of FCD in the emergency department context, and to outline initial management steps in the acute setting prior to referral to services dedicated to patients with FCD or FND.

## 2. Materials and Methods

This review was based on a search of the PubMed database using "functional cognitive disorder(s)", "emergency department", and "acute" as major medical subject headings (MESH) terms. Articles published in English from 1966 to August 2022 were reviewed. In addition, potentially relevant articles identified from the reference lists of the initial papers were reviewed, as well as papers relevant to the topic already known to the author. Very few relevant articles were found in the database search, most hits being unrelated to functional cognitive (or neurological) disorders per se, but to functional decline in other cognitive disorders. The paucity of relevant papers meant that only a narrative review could be performed.

## 3. Diagnosis of FCD

In whatever clinical setting FCD may be encountered, the diagnosis should be based on symptoms and signs which permit a positive diagnosis, just as for other forms of FND



**Table 1. “Core clinical features” of functional cognitive disorders (FCD) (based on [8]).**

- One or more persistent cognitive symptoms that are distressing and/or cause significant impairment in day-to-day function.
- Inconsistencies between self-reported symptoms and everyday function and/or neuropsychological test results.
- Symptoms not better explained by another diagnosis.
- Symptoms do not objectively progress over time although may fluctuate.

**Table 2. Proposed operational definition of FCD (based on [9]).**

1. One or more symptoms of impaired cognitive function.
2. Clinical evidence of internal inconsistency.<sup>a</sup>
3. Symptoms or deficits that are not better explained by another medical or mental disorder.<sup>b</sup>
4. Symptoms or deficit that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.<sup>c</sup>

a: Internal inconsistency indicates a worse self-reported performance compared to objective evidence, or inconsistency between situations, or at different time points (i.e., variability over time, not stability nor a pattern of decline).

b: Patients may have comorbid medical or psychiatric disorder as well as FCD.

c: A minimum of 6 months duration should be considered.

**Specifier:** Specify if: with/without a linked co-morbidity.

[2,3], rather than as an exclusionary or “rule out” diagnosis.

This approach permitted an initial formulation of the “core clinical features” of FCD (Table 1) [8].

Subsequently, a consensus document involving many clinicians working in the field proposed an operational definition of FCD (Table 2) [9,10].

As may be seen, central to both the “core clinical features” and the proposed operational definition is evidence of internal inconsistency, as for other FND. In FCD, this may take the form of being able to remember what one has forgotten, the ability to give a very clear account of memory lapses that have occurred, in contrast to the findings in patients with organic amnesia. Holding down a cognitively demanding job despite averts of poor memory may be another example of inconsistency.

In the acute setting, recourse to proposed operational definitions may not be practically possible. Hence, based on experience in non-acute settings [6], it may be useful to characterize an “archetypal” FCD patient (Table 3) [11]. The combination of the features seen in such an archetype, along with those unlikely to differentiate FCD from other causes of memory complaint (Table 4) [11], might be useful as a heuristic in the acute setting, pending validation of other diagnostic algorithms or screening instruments. Of course, any such “archetype” is necessarily provisional since precision is not possible pending ongoing debates about the exact description of FCD [9,10], and differential diagnoses (see Section 4) need to be kept in mind. To this end, a Delphi consensus study to develop a diagnostic decision checklist for patients with functional memory symptoms is currently in progress (V Cabreira, A Carson, personal communication) and may answer this particular clinical need.

Whilst a diagnosis of FCD, as for any FND, should not be based on any one single sign, some can be particularly helpful, such as the “attended alone” sign: patients

with neurocognitive disorder usually attend with an informant who can provide collateral history whereas FCD patients generally do not [12]. The “head turning” sign, the tendency to turn one’s head towards a partner, spouse, or friend when asked to give a history of the cognitive problems, may also support a non-functional diagnosis [13]. Hoover’s sign, which has been found of use in the diagnosis of functional weakness [14], has not as yet been assessed in patients with suspected FCD to the author’s knowledge, likewise tests of praxis.

There are some specific diagnostic situations that, although relatively unusual, merit particular consideration as they may be associated with the initial presentation of FCD to the emergency department. One is the functional amnesia typology of FCD (also sometimes known as dissociative or psychogenic amnesia), particularly those individuals with a fugue state [15]. Such individuals, most commonly men (M:F ≈ 3:1), may arrive in the emergency department with no knowledge of who they are or how they got there. Once collateral history becomes available it often transpires that they are many miles from their home. A key finding is profound retrograde amnesia mainly affecting the episodic-autobiographical domain of memory, manifesting as a loss of personal identity and inability to recognize close family members or the spouse/partner. A triggering event such as psychological stress or mild physical trauma may be identified. The other situation in which acute presentations of FCD may occur is after COVID-19 infection. This has been documented after COVID infection [16], and could theoretically also happen after COVID vaccination, as has been recorded for other types of FND [17] which may present to the emergency department [18,19].

#### **4. Differential Diagnosis of FCD in the Emergency Department**

In the emergency department setting, the differential diagnosis of FCD is potentially broad (Table 5) [20]. Here

**Table 3. “Archetypal” FCD features (based on [11]) as a possible heuristic for diagnosis.**

- Young age (50 s)
- “Attended alone” sign (= no immediate access to collateral history)
- Brings written list of symptoms (*La maladie du petit papier*)
- Positive family history of dementia (usually in an elderly relative, i.e., not a monogenic form of dementia)
- Disturbed sleep
- Disturbed mood
- Positive for subjective memory complaint on brief screener (e.g., Subjective Memory Complaint Likert scale)

**Table 4. Features unlikely to differentiate FCD from other causes of memory complaint (based on [11]).**

- Patient gender
- Patient handedness
- Referral source (primary or secondary care)
- Scores on simple cognitive screening instruments

other neurological disorders, rather than the suggested typologies of FCD [5], are the key practical concern. However, many of these conditions include symptoms in addition to memory impairment (e.g., changed level of consciousness) and hence may be relatively easily excluded from diagnostic consideration.

Amnesic stroke or ischaemic amnesia is a well-recognised but unusual form of stroke, for example following hippocampal infarction [21]. Paramedian thalamic infarcts are classically associated with an amnesic syndrome but these patients usually present with impaired consciousness from which the amnesic state emerges as recovery progresses.

Transient global amnesia (TGA) is characterized by the subacute onset of dense anterograde amnesia, manifesting as circular orienting questions but without loss of personal identity (cf. functional amnesia), and with a variable duration of retrograde amnesia. Pathogenesis is uncertain but is thought to be a consequence of spreading depolarization temporarily inactivating memory-eloquent structures in the hippocampal formation [22]. Although amnesic stroke may very occasionally present with a phenotype indistinguishable from TGA [23], TGA is not thought to be primarily a cerebrovascular disorder. The stereotyped presentation and prompt recovery of TGA should mean that it presents little diagnostic difficulty for emergency department clinicians who are the clinical constituency most likely to encounter these patients. Focal, punctate changes in the medial temporal lobe, most usually the cornu ammonis 1 (CA1) sector of the hippocampus, on diffusion-weighted magnetic resonance (MR) imaging of the brain may be helpful in differential diagnosis in the appropriate clinical circumstances [24]. Of current note, there are some preliminary data suggesting that COVID vaccination might be a risk factor for TGA [25].

Transient epileptic amnesia (TEA), a form of temporal lobe epilepsy, may be distinguished on clinical grounds from TGA based on the briefer (<1 h), more frequent, and

possibly less dense amnesic episodes [26]. These attacks often occur on awakening, and there may be other subtle ictal phenomena which that point to the diagnosis, such as automatism and olfactory hallucinations. Pathological tearfulness is a common accompanying feature [27]. Interictal memory problems such as accelerated long-term forgetting, autobiographical amnesia, and topographical amnesia are frequent accompaniments. Standard MR brain imaging is usually normal [26].

Mild traumatic brain injury may be characterized by a period of transient amnesia or, more often, a post-traumatic confusional state, and diagnosis is usually straightforward if there is patient or collateral history of head injury or other clinical stigmata thereof [28].

The possibility of drug-induced memory symptoms (e.g., due to hypnotics, sedatives, medications with anticholinergic effects) should always be considered but there is often concurrent evidence of impaired consciousness or encephalopathy, likewise with metabolic derangements such as acute alcohol withdrawal. Likewise, autoimmune encephalitides may be a cause of acute memory (and other cognitive) symptoms but these are usually associated with other features such as psychiatric symptoms, seizures, and movement disorders, although isolated memory impairment as the initial symptom of N-methyl-D-aspartate-receptor (NMDA-R) encephalitis has been described [29].

The possibility of acute memory symptoms being a consequence of the early stages of a hitherto unrecognized neurodegenerative disease process, such as Alzheimer’s disease, perhaps decompensated in the context of infection or metabolic derangement, should be considered, especially in older patients. Although delirium, the most common acute-on-chronic presentation [30], by definition requires impairment of consciousness or attention, isolated cognitive features as acute *de novo* presentations of neurodegenerative disease are described [31].

## 5. Investigation

Ideally, the diagnosis of FCD should be a positive one based on the typical symptoms and signs, aided by the proposed operational definition (Table 2) [9,10] and/or the suggested heuristic (Table 3) [11], and without recourse to neurological investigations which may only serve to reinforce patient concerns that some other pathological process is responsible.

**Table 5. Differential diagnosis of FCD in the emergency department.**

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Acute amnesia +/- other neurological findings (e.g., changed level of consciousness):
• Vascular: strategic brain infarct (paramedian thalamic nucleus; hippocampus)
• Transient global amnesia (TGA)
• Epileptic seizure: generalized; complex partial; transient epileptic amnesia (TEA)
• Traumatic brain (closed head) injury: post-traumatic amnesia or post-traumatic confusional state
• Drug-induced: e.g., benzodiazepines
• Metabolic: hypoglycaemia; thiamine deficiency
• Inflammatory: autoimmune encephalitides
• Psychogenic: functional (or dissociative or psychogenic) amnesia

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Acute-on-chronic, “decompensation”:
• Neurodegenerative disorders, e.g., Alzheimer’s disease with delirium, or post-operatively

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However, in the emergency department setting concern about the possibility of either stroke or seizure as the cause of any acute neurological presentation may understandably loom large. Some form of dedicated brain imaging may therefore be undertaken as a minimum. If this is MR brain imaging then some form of pre-emptive patient counseling about the possible finding of minor and/or incidental abnormalities is strongly recommended, as these are common and patients with functional disorders may focus their attention on such changes however irrelevant they are to pathogenesis.

Although the emergency department may be a challenging environment in which to administer cognitive screening instruments [32], it may be noted that screeners such as the Montreal Cognitive Assessment and the Mini-Addenbrooke’s Cognitive Examination do not reliably differentiate FCD from other (non-functional) causes of memory complaint, whereas measures of subjective memory complaint, such as the Subjective Memory Complaint Likert scale [33], may do so. Presumably, this is a reflection of the common observation in functional disorders that performance is more impaired when attended to than when undertaken automatically.

Very brief (two-question) screeners of sleep and mood may contribute in the appropriate clinical context to a positive diagnosis of FCD [34].

## 6. Management of FCD in the Emergency Department

Management of FCD in the emergency department comprises several elements, as for other forms of FND [2–4].

Firstly, giving the patient a positive diagnosis and a clear non-judgmental explanation is optimal. This may be supplemented with the provision of reliable information sources about symptoms (e.g., <https://neurosymptoms.org/en/>). This may be sufficient initial management: there is evidence that such an approach reduces the emergency room reattendance rate for other forms of FND [7].

Onward referral from the emergency department to a neurologist or unit with a dedicated interest in functional

disorders is appropriate where available, as the patient’s best interests may be better served in such a dedicated clinic than in a general neurology service. The purpose of such referral is to corroborate and reinforce the foregoing diagnostic process, unencumbered by the necessity to perform any further investigations and to focus on management. This may include, where necessary, addressing any comorbid neurological and/or psychiatric conditions. Evidence-based treatments for FCD have yet to be defined, unsurprisingly since the pathogenesis of these conditions remains to be fully elucidated.

## 7. Conclusions

FCD constitute a significant component of the work encountered in dedicated cognitive disorders clinics and it is to be anticipated that such patients will be seen in emergency department settings. Hence, as for other forms of FND, it behooves emergency department clinicians to have an awareness of these conditions, their diagnosis and differential diagnosis, and their initial management.

## Abbreviations

FCD, functional cognitive disorders; FND, functional neurological disorder; MR, magnetic resonance; TEA, transient epileptic amnesia; TGA, transient global amnesia.

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AJL wrote the manuscript.

## Ethics Approval and Consent to Participate

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## Conflict of Interest

The author declares no conflict of interest.

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