

Wandering: valutazione del fenomeno, caratteristiche del paziente, impatto clinico ospedaliero.

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Wandering: definition of a behavior

Wandering is a broad term covering a number of different specific types of behavior

Some authors include "wandering" in definitions of agitation or hyperactivity. Some studies have focused on specific aspects of, for example, the problem of patients with dementia who get lost.

However, in the majority of studies, terms such as wandering, hyperactivity, excessive walking, restlessness, and agitation are used in a general way to denote increased walking

prevalence of increased walking was estimated at 16%, attempting to leave home 10%, being brought back home 13%, trailing 14%, checking 14%, aimless walking 21%, pottering 19%, and inappropriate or excessive walking 10%

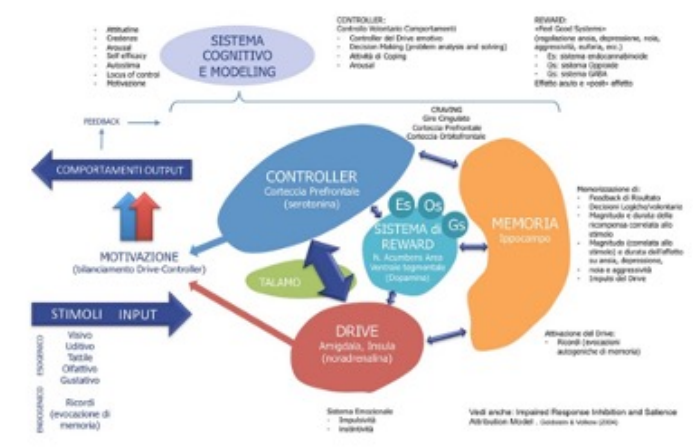
. Three main categories of wandering behavior were identified: trying to leave home, being brought back home, and "abnormal walking around."

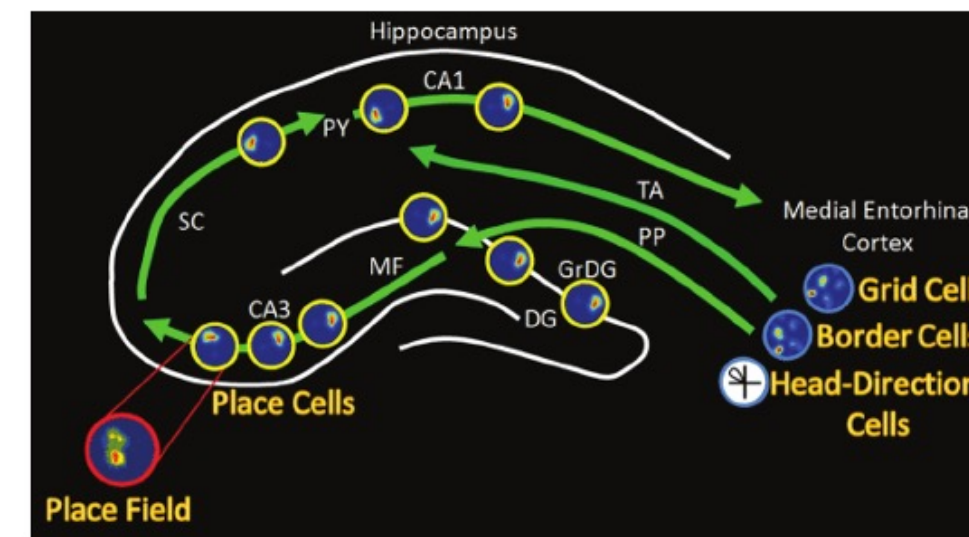
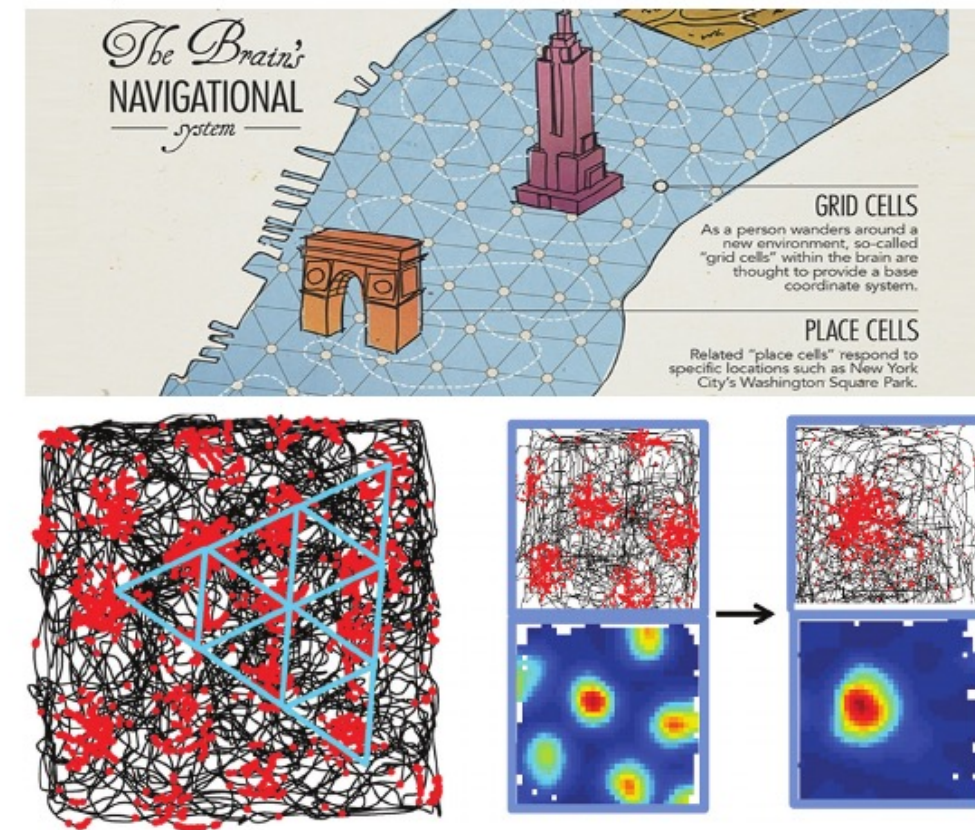
Navigation system

Recent research has established a fundamental role for the hippocampus and its functional connections with the entorhinal cortex, prefrontal cortex (PFC), cingulate cortex, and associated cerebral cortical networks involved in processing and responding to neural representations of objects and sounds in the environment.

Evidence that individual neurons encode the current position and orientation of the animal, as well as 'imagined' future navigation paths, emerged from electrophysiological recordings and brain-imaging studies of rodents navigating through space or in virtual reality scenarios .

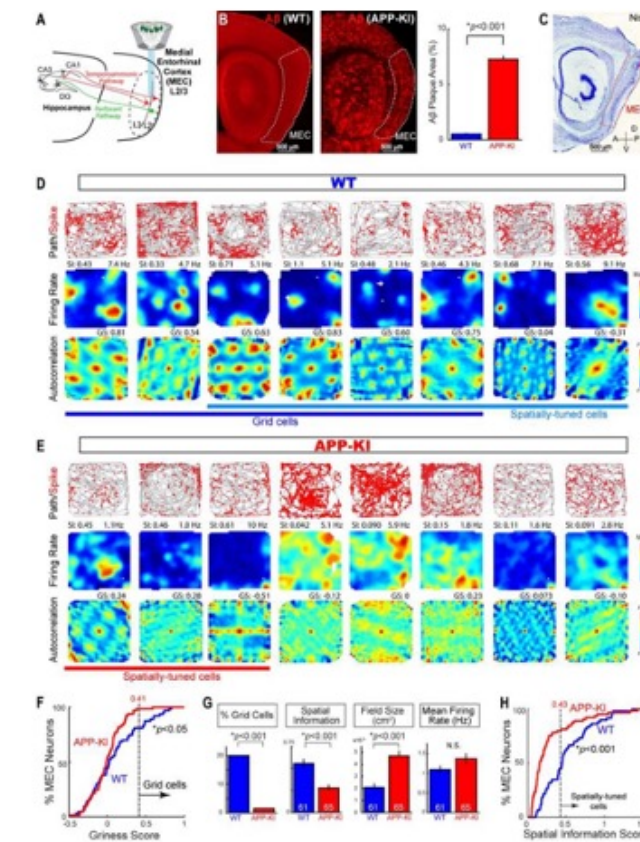
This research established that neurons in the hippocampus called '**place cells**' encode the current location of an animal within an environment, neurons called '**grid cells**' in the entorhinal cortex have hexagonally arranged firing fields, and other neurons encode head orientation





Failure in navigation system is the reason for wandering behavior in elderly

Place cells in the hippocampus exhibit distinct spike patterns in different environments, a circuit function called remapping. remapping is disrupted in the APP knock - in mouse model, suggesting that remapping impairment is a circuit mechanism underlying spatial memory impairment in Alzheimer's disease. These results point to remapping impairment in the hippocampus, possibly linked to grid cell disruption, as circuit mechanisms underlying spatial memory impairment in AD.



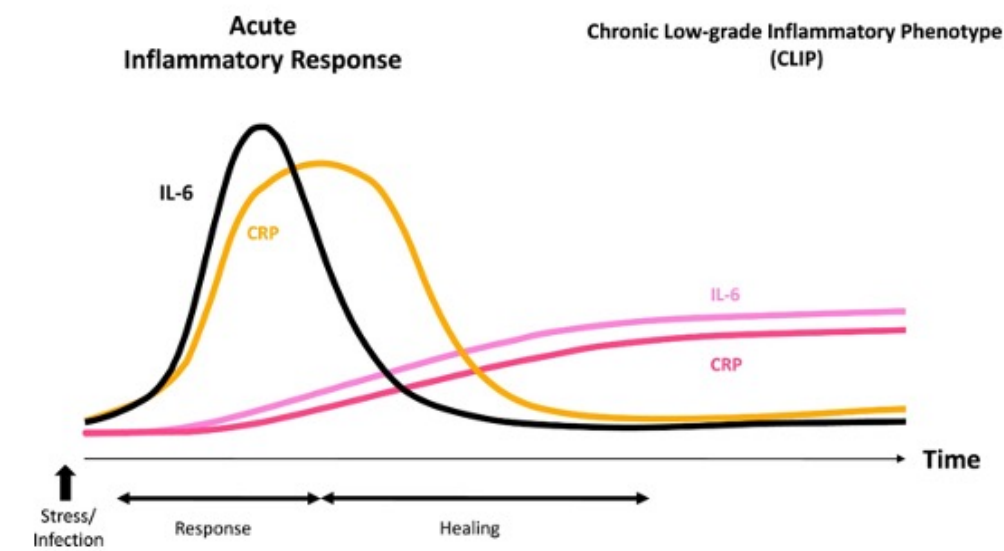
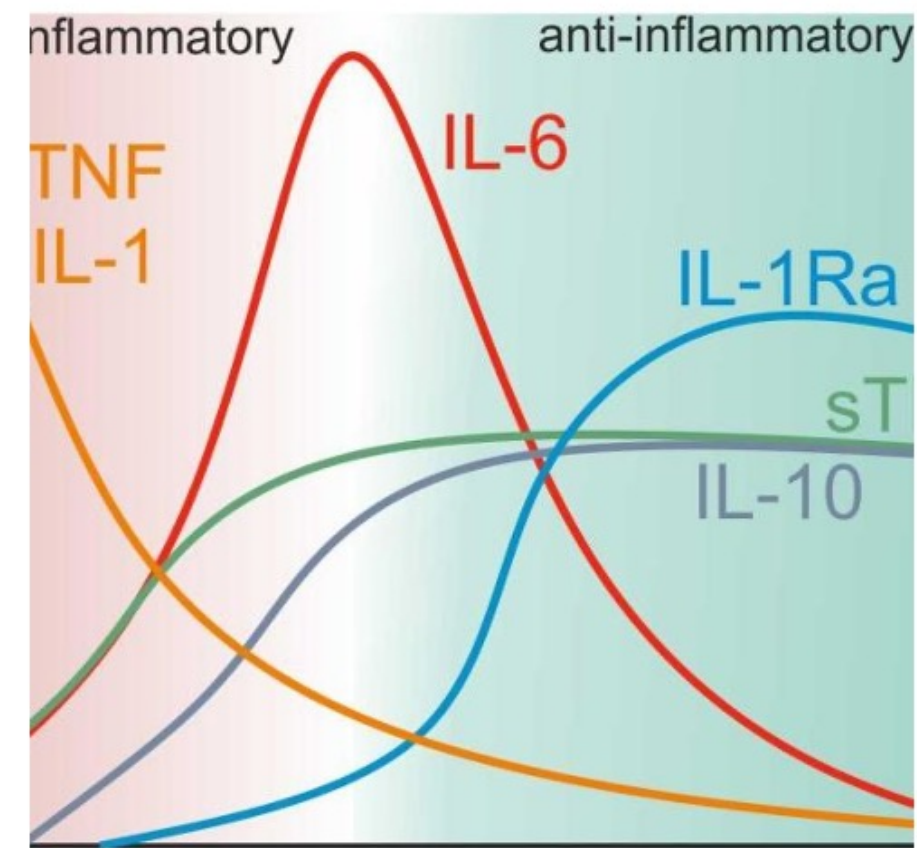
Proinflammatory cytokines, sickness behavior, and cognitive decline

Increased serum proinflammatory cytokines are associated with the presence of symptoms characteristic of sickness behavior, which are common neuropsychiatric features found in AD.

This association was independent of the presence of delirium.

Sickness behavior refers to a coordinated set of behavioral changes that develop during the course of raised systemic inflammation.

These behaviors include increased anxiety, depressed mood, and apathy, and are adaptive protective mechanisms aimed at conserving energy and reducing further exposure to systemic inflammatory insults. The core features of sickness behavior symptoms (apathy, anxiety, and depression) were also common (occurring in around 80%) in those subjects without detectable delirium.



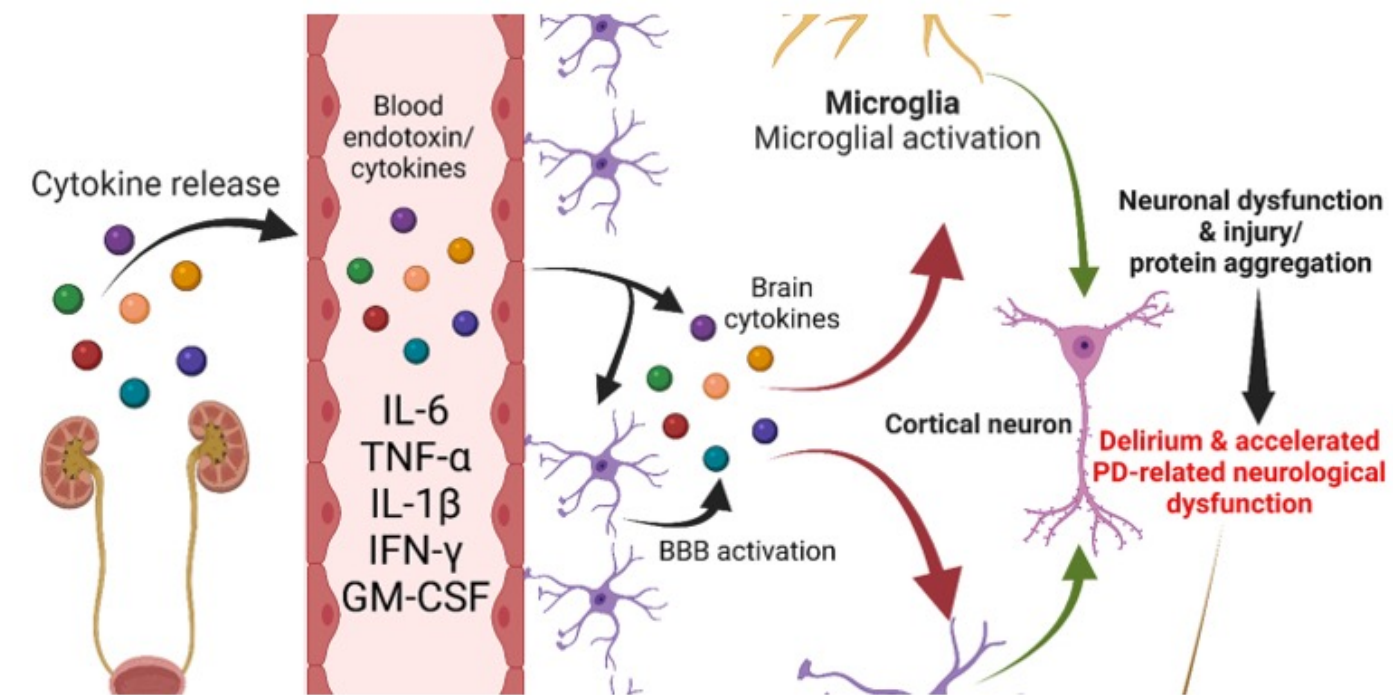


Table 1 Baseline serum systemic inflammatory markers and demographics

Systemic levels of inflammatory marker (n)	Age (SE), y	Sex, n (%) women	Baseline ADAS-Cog score (SE), patients
CRP			
Low <1 µg/mL (83)	81.0 (0.8) ^a	50 (60.2) ^d	28.0 (1.5) ^e
High ≥1 µg/mL (186)	83.5 (0.6)	124 (66.7)	30.7 (0.9)
TNFα			
Low <2.4 pg/mL (65)	79.5 (1.0) ^b	43 (66.2) ^d	25.6 (1.6) ^f
High ≥2.4 pg/mL (204)	83.9 (0.5)	131 (64.2)	31.0 (0.9)
IL-6			
Low <2.8 pg/mL (66)	81.1 (0.9) ^c	43 (65.2) ^d	30.0 (1.5) ^f
High ≥2.8 pg/mL (203)	83.3 (0.5)	131 (64.5)	29.3 (0.9)

Abbreviations: ADAS-Cog = Alzheimer's Disease Assessment Scale Cognitive subscale; CI = confidence interval; CRP = C-reactive protein; IL-6 = interleukin-6; TNFα = tumor necrosis factor α.

^a Mean difference 2.5 (95% CI 0.6 to 4.5) years; t test $p = 0.01$.

^b Mean difference 4.4 (95% CI 2.4 to 6.4) years; t test $p < 0.0001$.

^c Mean difference 2.2 (95% CI 0.2 to 4.3) years; t test $p = 0.03$.

^d $\chi^2 1.0, p = 0.3$.

^e $\chi^2 0.08, p = 0.8$.

^f $\chi^2 0.01, p = 0.9$.

^g Mean difference 2.7 (95% CI -6.1 to 0.7) patients; t test $p = 0.1$.

^h Mean difference 5.4 (95% CI 1.9 to 9.0) patients; t test $p = 0.003$.

ⁱ Mean difference -0.7 (95% CI -2.9 to 4.3) patients; t test $p = 0.7$.

Table 3 Period prevalence of systemic inflammatory events during the 6-month follow-up period and number (%) of subjects with this event experiencing one or more of the 3 core features of sickness behavior

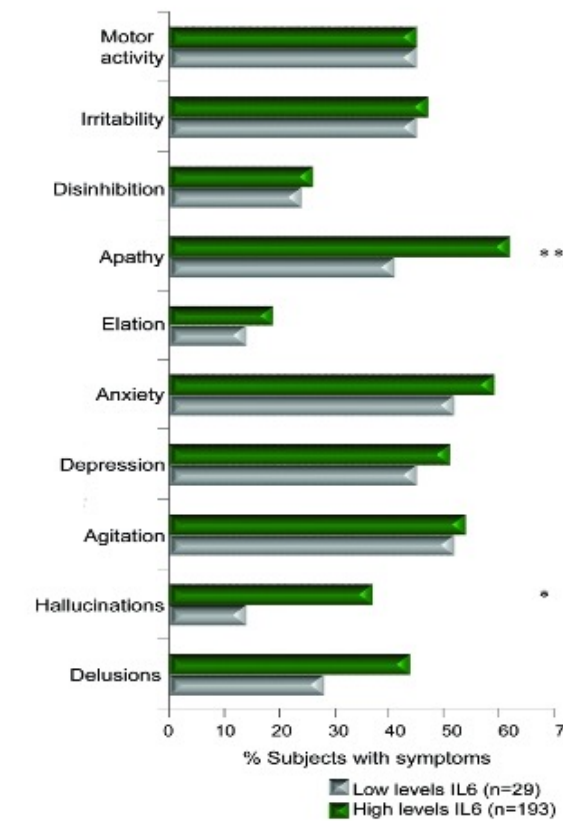
Systemic inflammatory event (no. of subjects identified with event)	No. (% of subjects identified with event) of subjects with one or more core features of sickness behavior
No event (112)	87 (78)
Respiratory infection (51)	44 (86)
Genitourinary infection (27)	22 (82)
Accidental trauma (32)	27 (84)
Gastrointestinal infection (14)	14 (100)
Other infections (13)	13 (100)
Surgical intervention (11)	10 (91)
Myocardial infarction (2)	1 (50)
History of hypertension (86)	54 (82)
History of hypercholesterolemia (35)	30 (86)
History of type II diabetes (16)	15 (94)

Raised serum TNF and IL-6, but not CRP, were associated with an approximately 2-fold increased frequency of neuropsychiatric symptoms characteristic of sickness behavior.

These relationships are independent of the development of delirium.

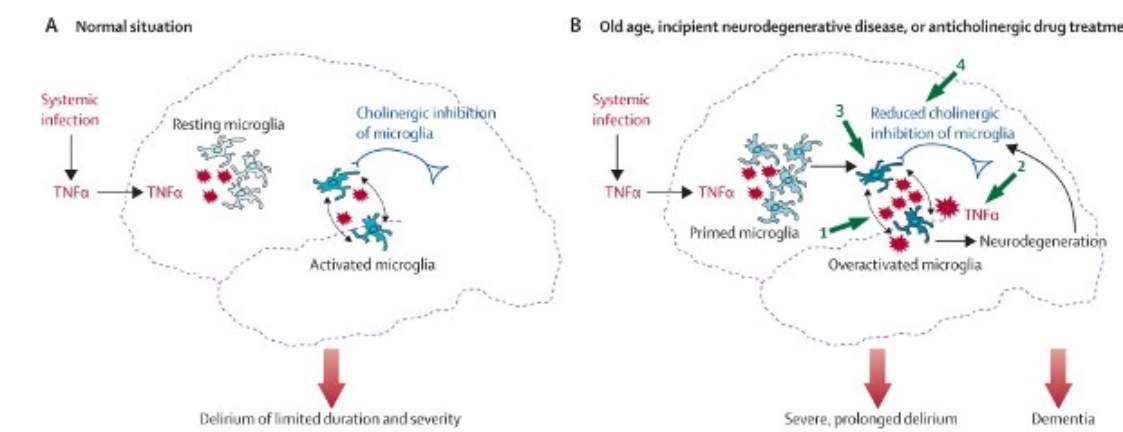
Raised TNF is associated with symptoms more characteristic of depressive symptomatology while raised IL-6 is more characteristic of a psychotic profile.

In addition, subjects with mild cognitive impairment show a NPI profile that is remarkably similar to that associated with sickness behavior, suggesting that the early presentation of these symptoms might represent the neurochemical consequences of microglial activation and consequently explain their poor cognitive outcome.



Neurotransmitters imbalance, immunity, frailty

Unsuccessful aging predispose to frailty
 Increased levels of pro-inflammatory cytokines (IL-6; TNF and IFN) , imbalance between peripheral and central neurotransmitters like Ach, NE, DA, GABA, 5-HT, might be responsible for excessive response to common stressors
 Repetead insults decrease resilience and open to individual vulnerability
 Increased vulnerability predispose to frailty
 Frail patient is more prone to both delirium or dementia
 The quantitative and qualitative features of noxious insult should be determinant for delirium occurrence.



Predictors for Wandering

Wandering is a behavior associated to aging

Wandering is mainly associated cognitive decline symptoms.

As the severity of dementia progresses the possibility to experience wandering increases

Patients with mild cognitive impairment (MCI) thus not demented, are less prone to manifest wandering behavior unless an associated cause induce cascade events leading to wandering (generally acute inflammatory factors)

Patients with psychiatric diseases and sometimes inappropriate drug assumption may experience wandering behavior

To date no umoral or behavioral markers are able to predict wandering behavior



Main Tests and Features

Old age (>70)

-Test spatial and temporal

orientation

-Evaluate presence of behavioral

Symptoms like apathy or

depression

-Ask for sleep-wake disturbances

-Syncope in elderly

-Loss of consciousness without a clinical history of epilepsy

-Fall and/or Postural instability

-Patient got lost

-Delirium

Conclusions

Wandering behavior is typical of advanced stages of dementia

In cognitively un-impaired individuals is very rare.

Its occurrence is heterogenous

Main difficulty is represented by the absence of reliable predictors

Wandering behavior in under-diagnosed or even mis-diagnosed patients represents the main difficulty for clinicians

Its appearance in under-diagnosed patients opens to a diagnosis of dementia

CRONACA Il Wandering dietro il caso Manna: cos'è e quali sono le proposte per combattere l'emergenza
Diversi i casi di pazienti affetti da problemi cognitivi o demenza che si allontanano dagli ospedali romani. Alcuni con esiti tragici: l'associazione invoca localizzatori gps e campagne informative

- Nel 2021 i casi di wandering negli ospedali romani sono stati numerosi. Alcuni hanno avuto esito positivo nel giro di pochi giorni, addirittura poche ore, grazie allo sforzo delle forze dell'ordine. Per citarne alcuni: GB di 85 anni [si è allontanato dal San Camillo](#) ed è stato ritrovato il giorno dopo sulla Salaria; il giorno successivo [un'altra donna è stata notata vagare per il quartiere San Giovanni](#) dagli agenti di Roma Capitale, e gli accertamenti hanno confermato che si era allontanata dal Policlinico Umberto I; di [SC](#), 86enne scomparso l'11 giugno da una rsa di Riofreddo, ancora oggi non si hanno notizie- [Un uomo di 82 anni è stato ritrovato sulla Colombo](#), in stato confusionale e a rischio investimento, dopo essere uscito dall'ospedale dove era ricoverato "per tornare a casa"; a gennaio una donna di 48 anni ha vagato per 10 km finendo sulla Roma Fiumicino .



Delitti in materia di violazione del diritto d'autore (Art. 25-novies, D.Lgs. n. 231/2001) [articolo aggiunto dalla L. n. 99/2009]

- Messa a disposizione del pubblico, in un sistema di reti telematiche, mediante connessioni di qualsiasi genere, di un'opera dell'ingegno protetta, o di parte di essa (art. 171, legge n.633/1941 comma 1 lett. a) bis)
- Reati di cui al punto precedente commessi su opere altrui non destinate alla pubblicazione qualora ne risulti offeso l'onore o la reputazione (art. 171, legge n.633/1941 comma 3)
- Abusiva duplicazione, per trarne profitto, di programmi per elaboratore; importazione, distribuzione, vendita o detenzione a scopo commerciale o imprenditoriale o concessione in locazione di programmi contenuti in supporti non contrassegnati dalla SIAE; predisposizione di mezzi per rimuovere o eludere i dispositivi di protezione di programmi per elaboratori (art. 171-bis legge n.633/1941 comma 1)
- Riproduzione, trasferimento su altro supporto, distribuzione, comunicazione, presentazione o dimostrazione in pubblico, del contenuto di una banca dati; estrazione o reimpiego della banca dati; distribuzione, vendita o concessione in locazione di banche di dati (art. 171-bis legge n.633/1941 comma 2)
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- Mancata comunicazione alla SIAE dei dati di identificazione dei supporti non soggetti al contrassegno o falsa dichiarazione (art. 171-septies legge n.633/1941)
- Fraudolenta produzione, vendita, importazione, promozione, installazione, modifica, utilizzo per uso pubblico e privato di apparati o parti di apparati atti alla decodificazione di trasmissioni audiovisive ad accesso condizionato effettuate via etere, via satellite, via cavo, in forma sia analogica sia digitale (art. 171-octies legge n.633/1941).

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