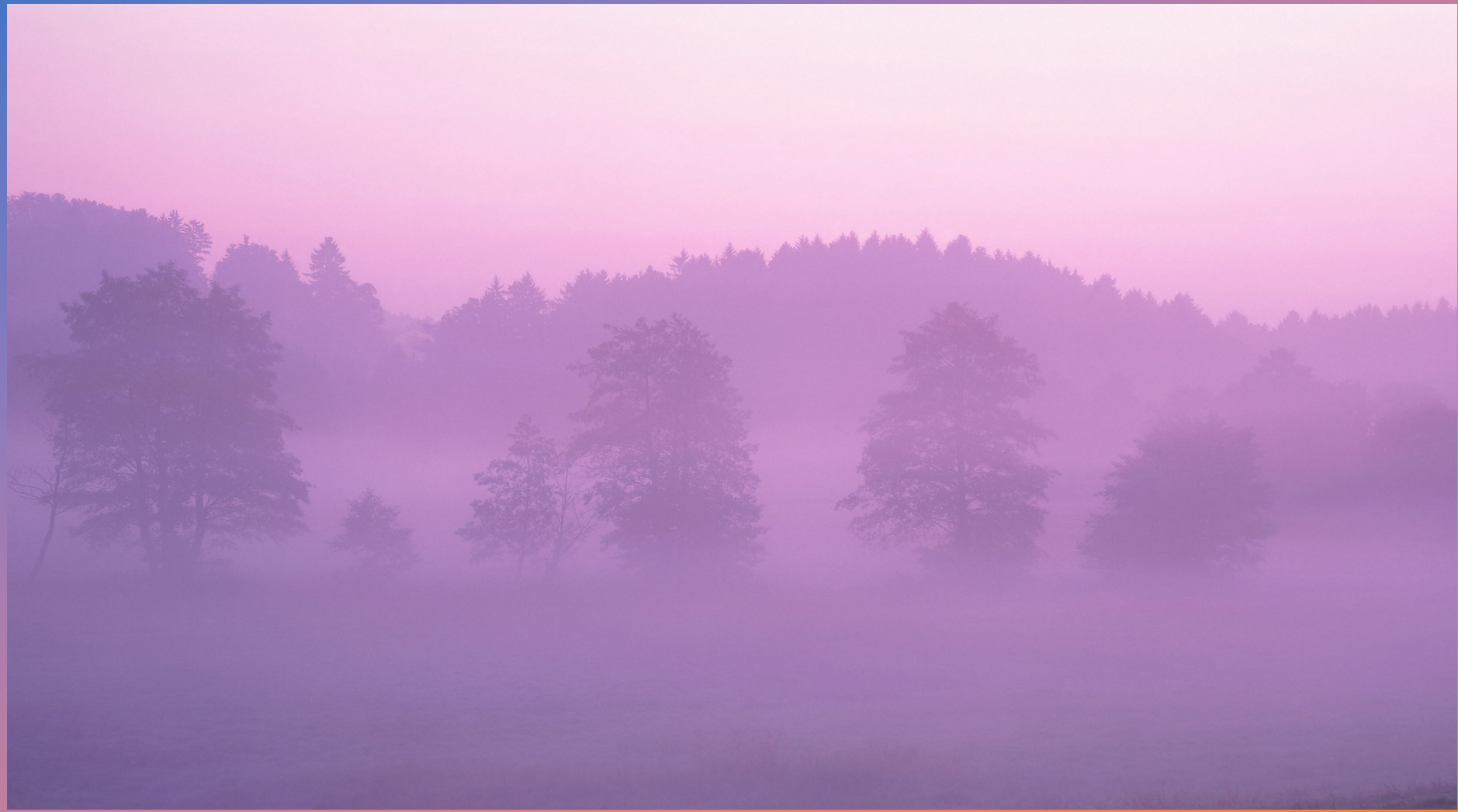


'Brain fog': the people struggling to think clearly months after Covid

THE WALL STREET JOURNAL.

OPINION | COMMENTARY

Humor Begins to Clear My Family's Covid Brain Fog

It took a little cross-multiplication, but we're getting better.

The New York Times

Brain Fog Plagues Covid Survivors

The condition is affecting thousands of patients, impeding their ability to work and function in daily life.

Memory loss and 'brain fog' may be side effects of COVID-19, new study shows

MICHELLE SHEN | USA TODAY

The Washington Post

Health

How covid brain fog may overlap with 'chemo brain' and Alzheimer's

Researchers say the brain inflammation in long covid is similar to that in cancer patients

Condición POST COVID-19
Un largo camino hacia la recuperación

21 / Abril / 2022
Barcelona

Entendiendo la Afectación Neurocognitiva y Funcional en la Condición Post-COVID-19

Jose A. Muñoz-Moreno

Psicólogo / Investigador / Profesor
Unitat de COVID Persistent
Hospital Germans Trias i Pujol
Badalona (Barcelona)

FUNDACIÓ LLUITA CONTRA LA SIDA I LES MALALTIES INFECCIOSES

Unitat Covid Persistent

Germans Trias i Pujol Hospital
Institut Català de la Salut

1. ¿Por qué afectación neurocognitiva en la COVID-19?

2. ¿Cuál es la frecuencia?

3. ¿En qué consiste?

4. ¿Por qué afectación funcional?

5. ¿Hay tratamiento?

1. ¿Por qué afectación neurocognitiva en la COVID-19?

COVID-19

Post

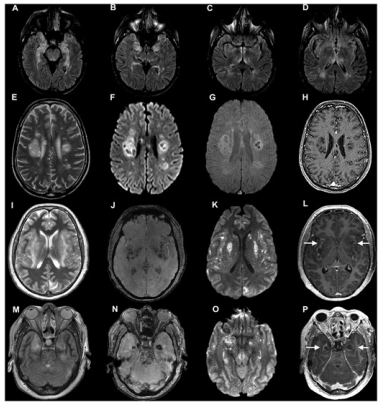
COVID-19

Afectación Neurológica Durante la COVID-19

Nervous system involvement after infection with COVID-19 and other coronaviruses

Yeshun Wu[a,b,1], Xiaolin Xu[c,1], Zijun Chen[b], Jiahao Duan[b], Kenji Hashimoto[d], Ling Yang[b], Cunming Liu[a,*], Chun Yang[a,*]

› Brain Behav Immun. 2020 Jul;87:18-22.



› Brain. 2020 Oct 1;143(10):3104-3120.

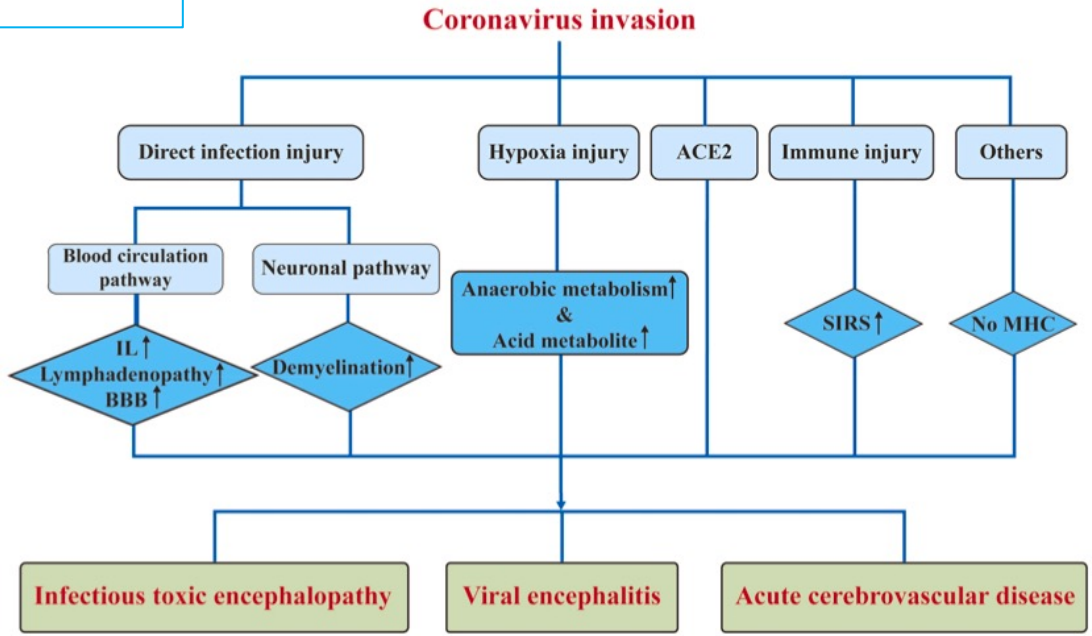


Fig. 2. Pathogenesis of nervous system injury caused by coronaviruses. ACE2: angiotensin-converting enzyme 2; BBB: blood brain barrier; IL: interleukin; MHC: major histocompatibility complexes; SIRS: systemic inflammatory response syndrome.

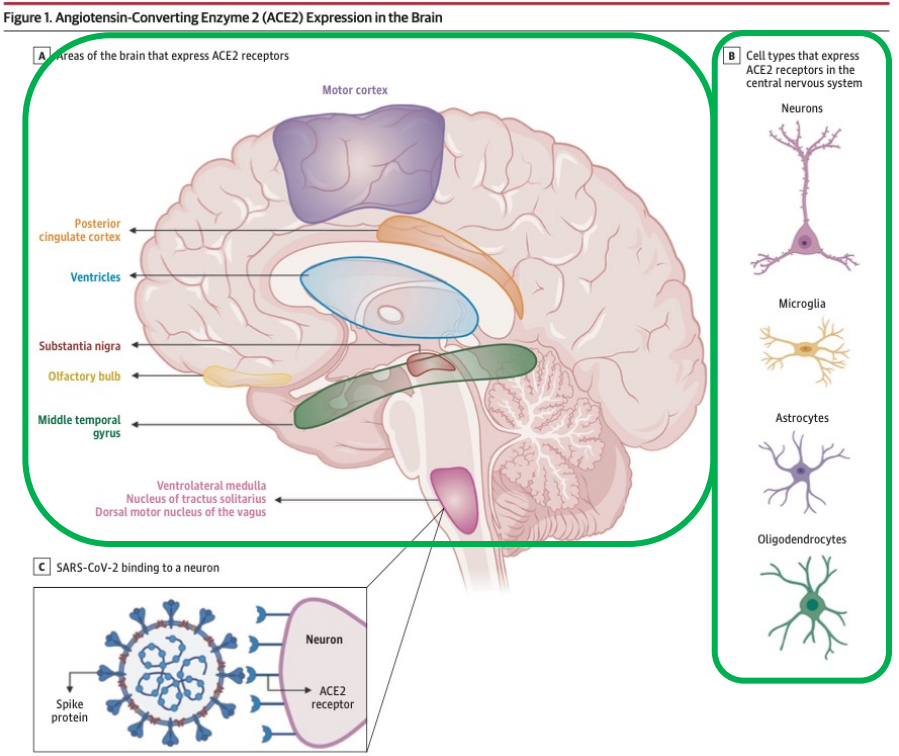
Afectación Neurológica Durante la COVID-19

Neuropathogenesis and Neurologic Manifestations of the Coronaviruses in the Age of Coronavirus Disease 2019 A Review

Adeel S. Zubair, MD; Lindsay S. McAlpine, MD; Tova Gardin, MD, MPP; Shelli Farhadian, MD, PhD; Deena E. Kuruvilla, MD; Serena Spudich, MD

JAMA Neurology August 2020 Volume 77, Number 8

- Receptores ACE2



Afectación Neurocognitiva Durante la COVID-19

Cognitive Impairment Is a Common Comorbidity in Deceased COVID-19 Patients: A Hospital-Based Retrospective Cohort Study

Paloma Martín-Jiménez [1], Mariana I Muñoz-García [1], David Seoane [1], Lucas Roca-Rodríguez [1], Ana García-Reyne [2], Antonio Lalueza [2 3 4], Guillermo Maestro [2], Dolores Folgueira [3 5], Víctor A Blanco-Palmero [1 4 6], Alejandro Herrero-San Martín [1 4 6], Sara Llamas-Velasco [1 4 6],

> J Alzheimers Dis. 2020;78(4):1367-1372.

Abstract

We analyzed the frequency of cognitive impairment (CI) in deceased COVID-19 patients at a tertiary hospital in Spain. Among the 477 adult cases who died after admission from March 1 to March 31, 2020, 281 had confirmed COVID-19. CI (21.1% dementia and 8.9% mild cognitive impairment) was a common comorbidity. Subjects with CI were older, tended to live in nursing homes, had shorter time from symptom onset to death, and were rarely admitted to the ICU, receiving palliative care more often. CI is a frequent comorbidity in deceased COVID-19 subjects and is associated with differences in care.

- N=281, fallecidos COVID-19.
- 21% demencia + 9% alteración cognitiva.
- Mayor edad, residencia, menor tiempo hasta fallecimiento.

COVID-19

Post

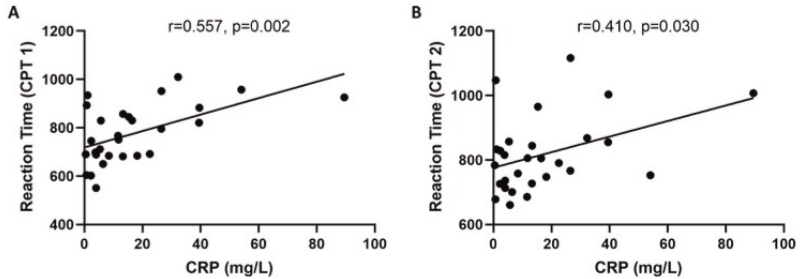
COVID-19

Afectación Neurocognitiva Después de la COVID-19

> J Psychiatr Res. 2020 Oct;129:98-102. doi: 10.1016/j.jpsychires.2020.06.022. Epub 2020 Jun 30.

The landscape of cognitive function in recovered COVID-19 patients

Hetong Zhou [1], Shaojia Lu [1], Jingkai Chen [1], Ning Wei [1], Dandan Wang [1], Hailong Lyu [1], Chuan Shi [2], Shaohua Hu [3]



Results of neuropsychological tests in all participants.

Measure	COVID-19 patients (N = 29)	Controls (N = 29)	t	*p*
Trail Making Test	47.82 ± 16.55	49.76 ± 21.53	−0.383	0.703
Sign Coding Test	32.14 ± 9.02	34.48 ± 13.31	−0.784	0.432
Digital Span Test	19.24 ± 5.36	18.97 ± 5.23	0.198	0.843
Continuous Performance Test				
CPT part 1				
Correct Number	9.83 ± 1.93	10.21 ± 2.62	−0.627	0.533
Error Number	0.41 ± 0.63	0.97 ± 2.61	−1.106	0.273
Missing Number	39.76 ± 1.96	38.83 ± 3.56	1.235	0.222
Reaction time	774.59 ± 119.33	843.22 ± 140.97	−2.001	0.050
CPT part 2				
Correct Number	7.07 ± 2.45	8.72 ± 1.79	−2.938	0.050
Error Number	1.38 ± 1.59	1.66 ± 2.19	−0.549	0.586
Missing Number	41.55 ± 2.90	39.59 ± 2.31	2.857	0.006*
Reaction time	817.06 ± 114.53	879.59 ± 123.87	−1.996	0.051
CPT part 3				
Correct Number	6.34 ± 2.50	8.21 ± 1.90	−3.198	0.002*
Error Number	3.28 ± 1.85	3.34 ± 2.32	−0.125	0.901
Missing Number	40.38 ± 3.10	38.45 ± 2.13	2.765	0.008*
Reaction time	868.24 ± 99.73	879.10 ± 197.08	−0.265	0.792

- Grupos pequeños.
- No duración post-infección.
- Asociación con inflamación.

Afectación Neurocognitiva Después de la COVID-19

Research Letter | Neurology

Assessment of Cognitive Function in Patients After COVID-19 Infection

Jacqueline H. Becker, PhD; Jenny J. Lin, MD, MPH; Molly Doernberg, MPH; Kimberly Stone, MPH; Allison Navis, MD; Joanne R. Festa, PhD; Juan P. Wisnivesky, MD, DrPH

JAMA Network Open October 22, 2021

- N=740, EUA.
- 7 meses.

Table 2. Prevalence of Cognitive Impairment After COVID-19 Infection

Cognitive domain	Impaired (z score ≤1.5), No. (%)				Adjusted odds ratio (95% CI)[a]	
	Total (N = 740)	Outpatient (n = 379)	ED (n = 165)	Hospitalized (n = 196)	ED vs outpatient	Hospital vs outpatient
Attention	74 (10)	19 (5)	10 (6)	29 (15)	0.8 (0.3-2.0)	2.8 (1.3-5.9)
Working memory	74 (10)	30 (8)	17 (10)	29 (15)	1.0 (0.5-2.2)	1.7 (0.8-3.3)
Processing speed	133 (18)	57 (15)	21 (13)	55 (28)	0.7 (0.4-1.3)	1.4 (0.8-2.5)
Executive functioning	118 (16)	45 (12)	23 (14)	53 (27)	1.0 (0.5-1.8)	1.8 (1.0-3.4)
Phonemic fluency	111 (15)	42 (11)	25 (15)	39 (20)	0.9 (0.5-1.8)	1.5 (0.8-2.8)
Category fluency	148 (20)	49 (13)	35 (21)	69 (35)	1.8 (1.1-3.1)	3.0 (1.7-5.2)
Memory encoding	178 (24)	61 (16)	43 (26)	73 (37)	1.7 (1.0-3.0)	2.3 (1.3-4.1)
Memory recall	170 (23)	45 (12)	38 (23)	76 (39)	1.5 (0.9-2.6)	2.2 (1.3-3.8)
Memory recognition	74 (10)	34 (9)	20 (12)	25 (13)	1.5 (0.8-3.0)	1.1 (0.5-2.4)

Abbreviation: ED, emergency department.

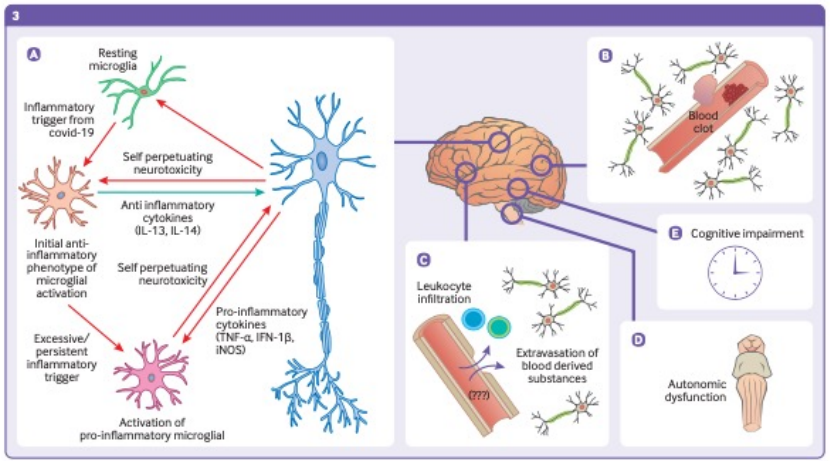
[a] Adjusted for race and ethnicity, smoking history, body mass index (calculated as weight in kilograms divided by height in meters squared), comorbidities, and depressive symptoms.

Posibles Causas Afectación Neurocognitiva Post-COVID

Long covid—mechanisms, risk factors, and management

Harry Crook,[1] Sanara Raza,[1] Joseph Nowell,[1] Megan Young,[1] Paul Edison[1,2]

the bmj | *BMJ* 2021;374:n1648



- 1) ¿Efecto legado?
- 2) ¿Persistencia respuesta inmune / neuroinflamación?
- 3) ¿Partículas víricas / neurotoxicidad?
- 4) ¿Alteración cerebrovascular / hipercoagulación?
- 5) ¿Disfunción barrera hematoencefálica?
- 6) ¿Peor estado neuropsiquiátrico?
- 7) ¿Menor estimulación cognitiva y/o social?

2. ¿Cuál es la frecuencia?

Frecuencia Síntomas Neurocognitivos Post-COVID

JAMA Network Open. > JAMA Netw Open. 2021 Oct 1;4(10):e2130645.

Research Letter | Neurology

Assessment of Cognitive Function in Patients After COVID-19 Infection

Jacqueline H. Becker, PhD; Jenny J. Lin, MD, MPH; Molly Doernberg, MPH; Kimberly Stone, MPH; Allison Navis, MD; Joanne R. Festa, PhD; Juan P. Wisnivesky, MD, DrPH

➤ N=740, EUA, 7 meses.

➤ 24%: Problemas memoria, 39%: hospitalizados.

ANNALS of Clinical and Translational Neurology > Ann Clin Transl Neurol. 2021 May;8(5):1073-1085.

Persistent neurologic symptoms and cognitive dysfunction in non-hospitalized Covid-19 "long haulers"

Edith L. Graham, Jeffrey R. Clark, Zachary S. Orban, Patrick H. Lim, April L. Szymanski, Carolyn Taylor, Rebecca M. DiBiase, Dan Tong Jia, Roumen Balabanov, Sam U. Ho, Ayush Batra, Eric M. Liotta & Igor J. Koralnik

Davee Department of Neurology, Northwestern University Feinberg School of Medicine, Chicago, Illinois

➤ N=100, EUA, 5 meses.

➤ 81%: Niebla mental, 32%: memoria, 27%: concentración.

frontiers in Neurology > Front Neurol. 2021 Jul 29;12:699582.

Cognitive Impairment After COVID-19—A Review on Objective Test Data

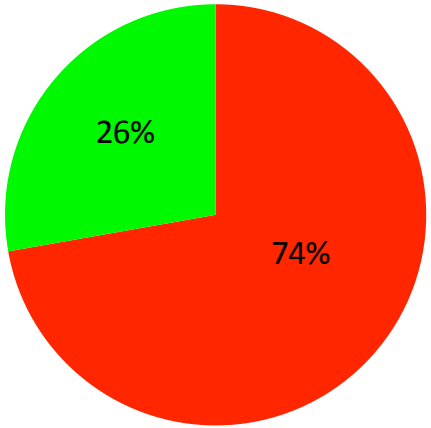
Rania Daroische[1], Mathilde S. Hemminghyth[1,2], Thomas H. Eilertsen[1], Monica H. Breitve[1,2,3] and Luiza J. Chwiszczuk[2,3]*

➤ Revisión sistemática, 12 estudios.

➤ 15%-80%: Alteración cognitiva.

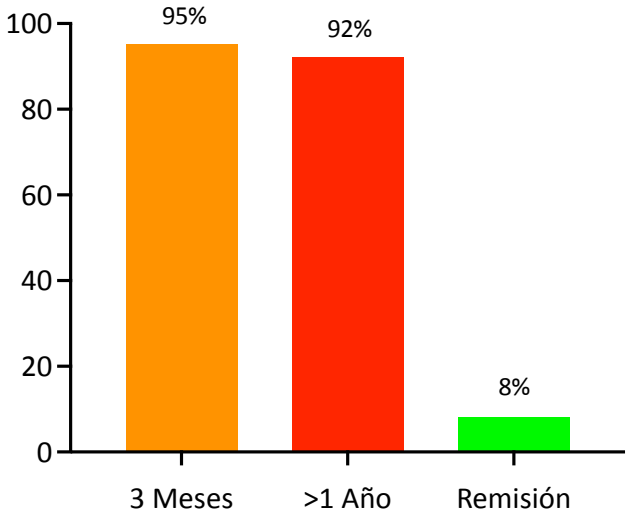
Frecuencia Síntomas Neurocognitivos Post-COVID

Frecuencia



N=342

Duración



3. ¿En qué consiste?

Descripción Síntomas Neurocognitivos Post-COVID

JAMA Network Open. > JAMA Netw Open. 2021 Oct 1;4(10):e2130645.

Research Letter | Neurology

Assessment of Cognitive Function in Patients After COVID-19 Infection

Jacqueline H. Becker, PhD; Jenny J. Lin, MD, MPH; Molly Doernberg, MPH; Kimberly Stone, MPH; Allison Navis, MD; Joanne R. Festa, PhD; Juan P. Wisnivesky, MD, DrPH

- N=740, EUA, batería neuropsicológica.
- Codificación memoria (24%), pérdidas de memoria, fluencia categórica, velocidad procesamiento, funcionamiento ejecutivo y fluencia fonémica (15%).

EClinicalMedicine > EClinicalMedicine. 2021 Sep;39:101044.

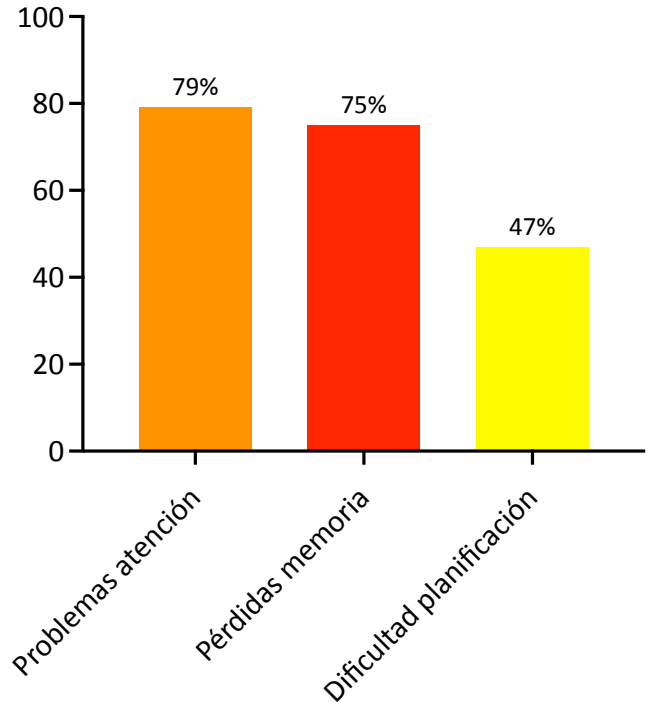
Cognitive deficits in people who have recovered from COVID-19

Adam Hampshire[a,*], William Trender[a], Samuel R Chamberlain[b,c], Amy E. Jolly[a], Jon E. Grant[d], Fiona Patrick[e], Ndaba Mazibuko[e], Steve CR Williams[e], Joseph M Barnby[e], Peter Hellyer[a,e], Mitul A Mehta[e]

- N=12.689, UK, cuestionario online.
- Razonamiento, planificación y tiempos de reacción.

Descripción Síntomas Neurocognitivos Post-COVID

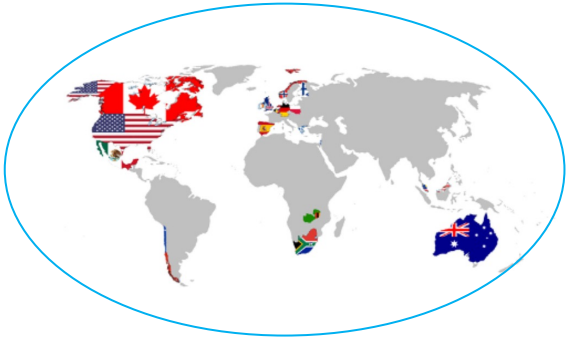
N=247



Descripción Síntomas Neurocognitivos Post-COVID

Assessment of Neurocognitive Functions, Olfaction, Taste, Mental, and Psychosocial Health in COVID-19 in Adults: Recommendations for Harmonization of Research and Implications for Clinical Practice

Lucette A. Cysique[1,19,20,*], Emilia Łojek[2,*], Theodore Ching-Kong Cheung[3,†], Breda Cullen[4,†], Anna Rita Egbert[5,†], Jonathan Evans[4,†], Maite Garolera[6,†], Natalia Gawron[7,†], Hetta Gouse[8,†], Karolina Hansen[2,†], Paweł Holas[2,†], Sylwia Hyniewska[9,†], Ewa Malinowska[2,†], Bernice A. Marcopulos[10,11,†], Tricia L. Merkley[12,†], Jose A. Muñoz-Moreno[13,†], Clare Ramsden[14,†], Christian Salas[15,†], Sietske A.M. Sikkes[16,†], Ana Rita Silva[17,†], Imane Zouhar[18,†] and the NeuroCOVID International Neuropsychology Taskforce



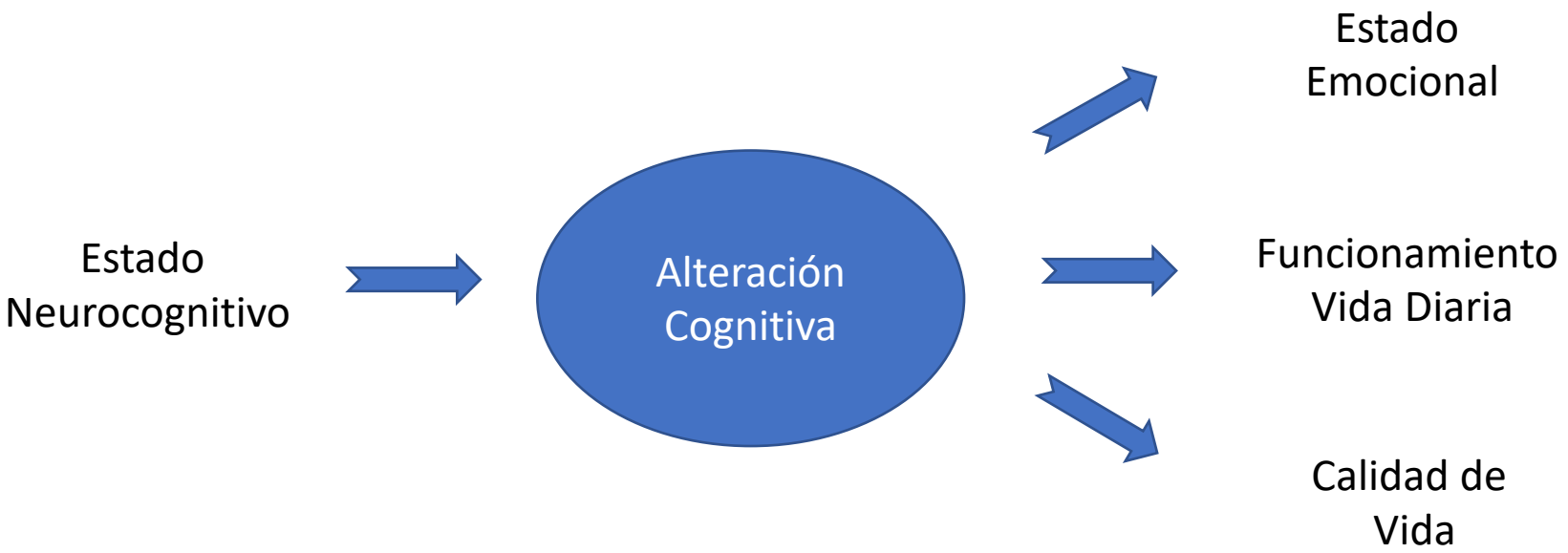
Journal of the International Neuropsychological Society (2021), 1–20

doi:10.1017/S1355617721000862

- 1) Atención y Memoria de Trabajo.
- 2) Funcionamiento Ejecutivo.
- 3) Función Motora.
- 4) Velocidad del Procesamiento.
- 5) Aprendizaje y Memoria Verbal.

4. ¿Por qué afectación funcional?

Afectación Funcional Post-COVID



Afectación Funcional Post-COVID

Alteración Cognitiva

Fatiga

Artralgias

Palpitaciones

Disnea

Insommnio

Cefaleas

Fuente: Institutbroggi.org

5. ¿Hay tratamiento?

Estrategias Terapéuticas

PM&R WILEY

Multi-disciplinary collaborative consensus guidance statement on the assessment and treatment of cognitive symptoms in patients with post-acute sequelae of SARS-CoV-2 infection (PASC)

Jeffrey S Fine [1], Anne Felicia Ambrose [2], Nyaz Didehbani [3], Talya K Fleming [4], Lissette Glashan [5], Michele Longo [6], Alexandra Merlino [7], Rowena Ng [8], Gerald J Nora [9], Summer Rolin [10], Julie K Silver [11], Carmen M Terzic [12], Monica Verduzco-Gutierrez [13], Sarah Sampsel [14]

> PM R. 2022 Jan;14(1):96-111. doi: 10.1002/pmrj.12745. Epub 2022 Jan 12.

TABLE 4 Neurocognitive assessment tools and therapeutic intervention strategies by cognitive domain

Cognitive domain*	Patient concerns	Assessment tools	Therapeutic interventions
Attention	• Brain fog • Difficulty with concentration on tasks • Losing train of thought • Misplacing objects • Miscalculation • Easily distracted	• Digit Span • Digit Vigilance Test • Cancellation	Attention process training for verbal and nonverbal tasks, metacognitive strategies, timed structured activities, minimize distractions.
Processing speed	• Slowed thought processes • Difficulty following conversations	• Coding • Continuous Performance Test • Symbol Search • Trails A	Recording talks, lectures, etc. to review at own pace; practicing skills repeatedly towards automaticity; breaking projects to components to complete over time.
Motor function/speed	• Slowed motor function	• Grooved Pegboard	Use of dictation devices (speech to text).
Language	• Word finding difficulty during conversation • Grasping for words • Verbal fluency • Difficulty with comprehension of multiple step instructions due to changes in recall and comprehension	• Letter Fluency • Category Fluency • Boston Naming Test • Neuropsychological Assessment Battery (NAB) Naming • Multilingual Aphasia Examination (MAE) Token Test • Portions of the Western Aphasia Battery-R • Scales of Cognitive and Communicative Ability for	Semantic feature analysis, word finding strategies, use word associations, convergent/divergent naming tasks, anagrams. Structured tasks with speech-language pathology (SLP) to address various domains, such as comprehension, recall, word finding, thought organization, identification of strategies for all domains that are impaired based on assessments.

Estrategias Terapéuticas

UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Trial studying technique to clear 'brain fog' after COVID-19

Matt Windsor | UAB Reporter

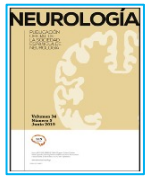
February 22, 2021 | Print | Email

What is CI Therapy?

Constraint-Induced therapy or CI therapy is a well-known therapeutic approach to rehabilitation after stroke, multiple sclerosis (MS) and traumatic brain injury (TBI). CI therapy consists of a family of treatments that teach the brain to "rewire" itself following

'Playing Scrabble again'

Estrategias Terapéuticas



CARTA AL EDITOR

Programa de rehabilitación neuropsicológica en pacientes con síndrome post-COVID-19: una experiencia clínica

> Neurologia. 2021 Sep;36(7):565-566.

- N=50 pacientes.
- 8 semanas, 5 sesiones/semana, 1 h.

- Mejora general en memoria.
- Hospitalizados: aprendizaje, memoria y fluencia verbal.
- No hospitalizados: velocidad procesamiento y memoria.

- No grupo control.
- Bajos tamaños efecto.
- No evaluación post.

Estrategias Terapéuticas

BECA CARLES CAPDEVILA

Entrar

Beca Carles Capdevila a la Cura de les Persones

20.000 € per impulsar un projecte que se centri en pal·liar les seqüeles físiques i/o psicològiques del covid, des del punt de vista assistencial o mèdic.

CORONA VIRUS

Sol·licita la beca

ara

Amb la col·laboració de:

Col·legi Oficial de Psicòlegs de Catalunya

SALUT

La secretària general de Salut, Meritxell Masó, entregant el xec de la beca al psicòleg clínic de la Fundació Lluita contra la Sida José Antonio Muñoz. FRANCESC MELGOSA

La Fundació Lluita contra la Sida obté la beca Carles Capdevila

El projecte proposa millorar la vida dels pacients amb covid persistent

que la vacunació es mantingui com a prioritat a tot el món".

Clotet va viure en primera línia dues pandèmies: la sida i el coronavirus. De la primera –de la qual és un profund coneixedor–, malgrat la devastació mortífera que va comportar, se'n poden treure també coses positives: va generar molt coneixement, va conscienciar molt la societat i va fer sorgir moviments molt proactius a

Estrategias Terapéuticas

TABLE 5 PASC cognitive symptom treatment recommendations

#	Statement
1	For patients who screen positive for cognitive symptoms, refer to a specialist (ie, speech-language pathologist, occupational therapist, neuropsychologist) with expertise in formal cognitive assessment and remediation. (See Table 3 for specialist referral options; and Table 4 for examples of Assessment Tools and Intervention Options by Cognitive Domain.)
2	Treat, in collaboration with appropriate specialists, underlying medical conditions, such as pain, insomnia/sleep disorders (including poor sleep hygiene), and mood disorders that may be contributing to cognitive symptoms.
3	Complete, in collaboration with patient primary care provider, medication polypharmacy reduction, weaning or deprescribing medications if medically feasible with emphasis on medications that may impact cognition
4	Reinforce sleep hygiene techniques including nonpharmacologic approaches as first line of sleep remediation.
5	Similar to patients experiencing "physical" fatigue, patients should be advised to begin an individualized and structured, titrated return to activity program.
5a	For patients who achieve a return to their normal, daily activities, regular exercise (at least 2–3 times/week of aerobic exercise) may be effective in improving cognition and also contribute to improved sleep patterns.
5b	Frequent assessment of the impact of return to normal, daily activities (including school, work, driving, operating heavy machinery, etc.) is recommended to ensure that symptoms do not flare and exercise is tolerated.

Abbreviation: PASC, postacute sequelae of SARS-CoV-2 infection.

Medication polypharmacy considerations in cognitive symptoms

1. Anticholinergics
   a. First-generation antihistamines (e.g., diphenhydramine, hydroxyzine, meclizine)
   b. Antispasmodics (e.g., scopolamine)
   c. Central alpha agonists (e.g., clonidine)
2. Central nervous system
   a. Antidepressants (e.g., amitriptyline, nortriptyline, paroxetine)
3. Antipsychotics - conventional and atypical (e.g., risperidone, quetiapine, olanzapine, ziprasidone)
4. Benzodiazepines (e.g., alprazolam, diazepam, lorazepam, temazepam)
5. Nonbenzodiazepine, benzodiazepine receptor agonist hypnotics (e.g., eszopiclone, zaleplon, zolpidem)
6. Skeletal muscle relaxants (e.g., varisoprodol, cyclobenzaprine)

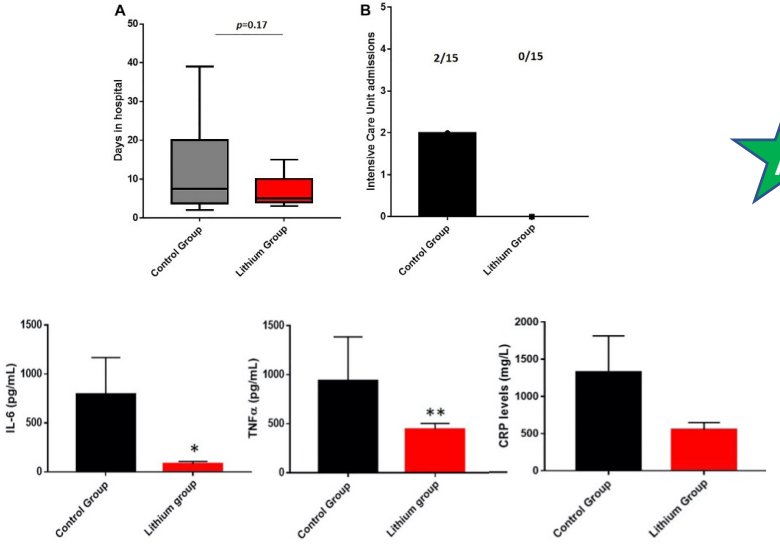
Estrategias Terapéuticas

frontiers | Frontiers in Pharmacology

Efficacy and Safety of Lithium Treatment in SARS-CoV-2 Infected Patients

Carlos Spuch[1†], Marta López-García[1,2†], Tania Rivera-Baltanás[1†], J. J Cabrera-Alvargonzález[3], Sudhir Gadh[4], Daniela Rodrigues-Amorim[1,5], Tania Álvarez-Estévez[1,2], Almudena Mora[1], Marta Iglesias-Martínez-Almeida[1,6], Luis Freiría-Martínez[1,6], Maite Pérez-Rodríguez[7], Alexandre Pérez-González[7], Ana López-Domínguez[7], María Rebeca Longueira-Suarez[7], Adrián Sousa-Domínguez[7], Alejandro Araújo-Ameijeiras[7], David Mosquera-Rodríguez[1,8], Manuel Crespo[3], Dolores Vila-Fernández[8], Benito Regueiro[3,9,10] and Jose Manuel Olivares[1,2]*

April 2022 | Volume 13 |



A

Lithium improves HIV-associated neurocognitive impairment

Scott L. Letendre[a], Steven P. Woods[b], Ronald J. Ellis[c], J. Hampton Atkinson[b], Eliezer Masliah[c], Geoffrey van den Brande[c], Janis Durelle[c], Igor Grant[b], Ian Everall[b] and the HNRC Group*

AIDS 2006, **20**:1885–1888

Lithium therapy for human immunodeficiency virus type 1–associated neurocognitive impairment

Giovanni Schifitto,[1,3] Jianhui Zhong,[2,3] David Gill,[4] Derick R Peterson,[5] Michelle D Gaugh,[1] Tong Zhu,[2] Madalina Tivarus,[3] Kim Cruttenden,[1] Sanjay B Maggirwar,[6] Howard E Gendelman,[7] Stephen Dewhurst,[8] and Harris A Gelbard[1,8]

Journal of NeuroVirology, iFirst; 1–11, 2009

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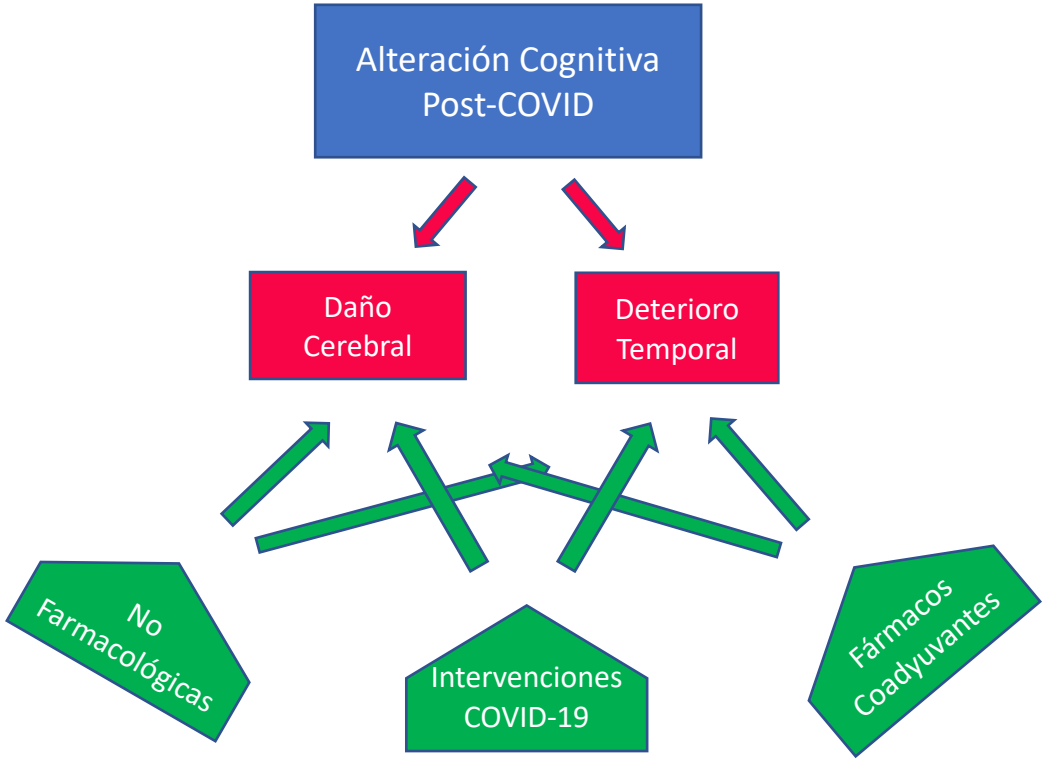
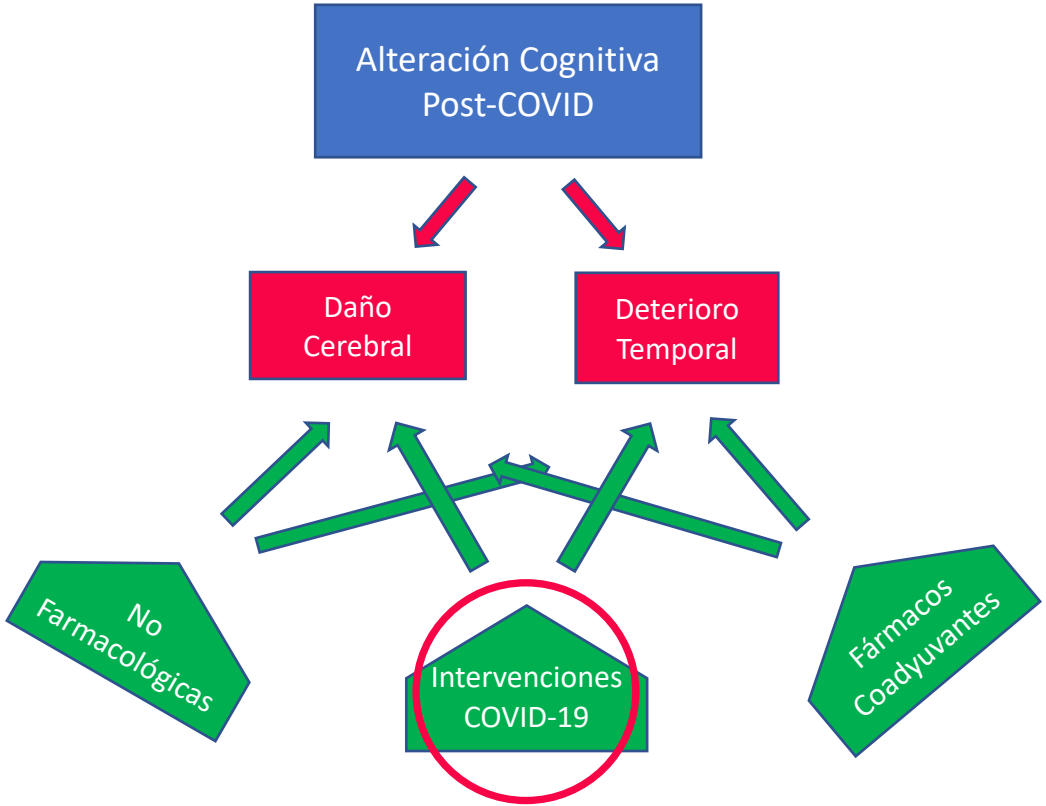
Estrategias Terapéuticas



Estrategias Terapéuticas



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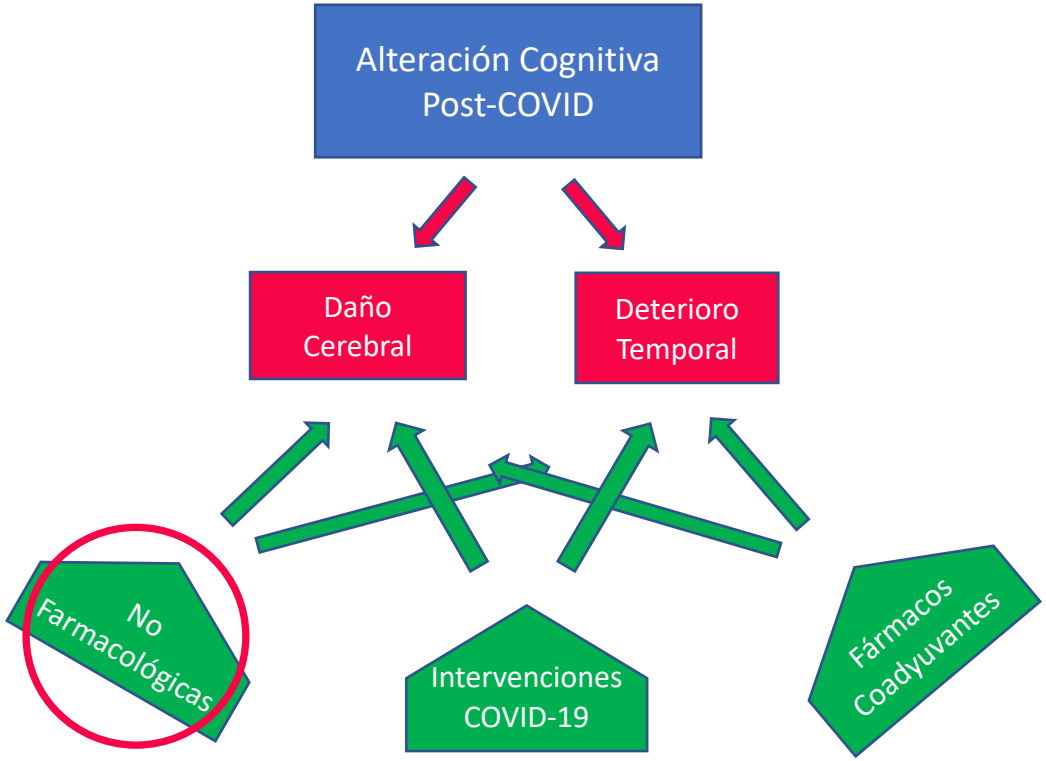

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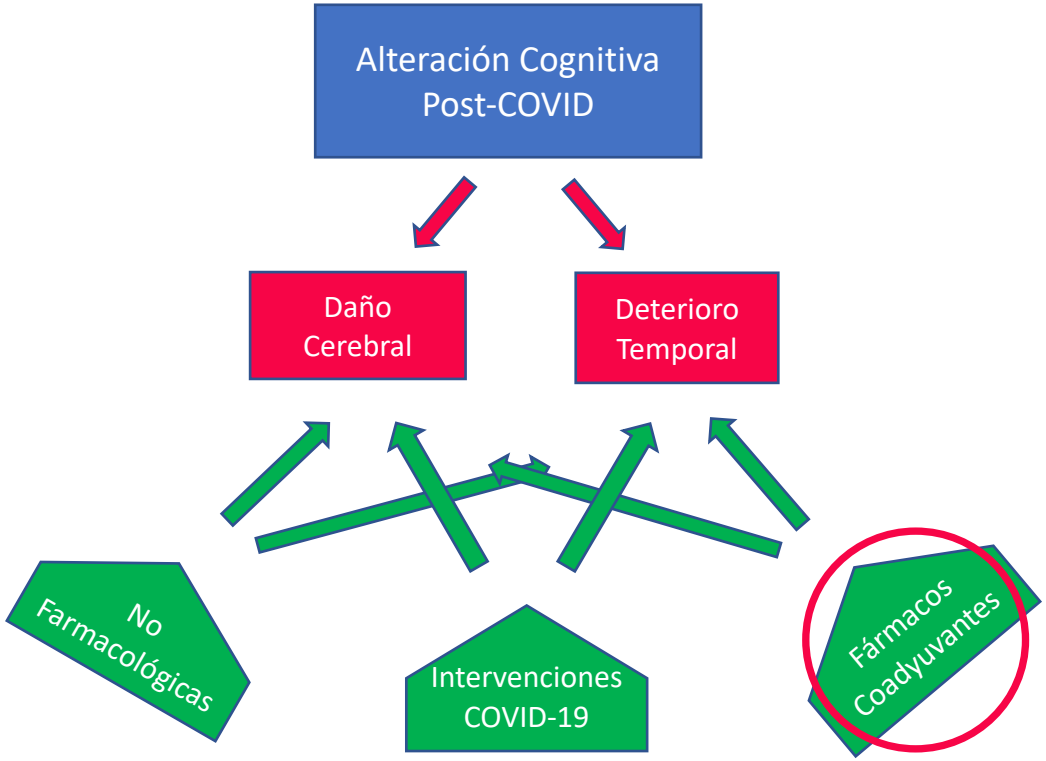

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5. No existe un tratamiento único recomendado, aunque diferentes intervenciones podrían ayudar.

International Neuropsychological Society

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Global Innovations in Science and Practice

2022 Meeting

Barcelona, Spain | July 6 – 8, 2022

NeuroCOVID SIG Symposium: Cross-Cultural Considerations and Updated International Results

Jose A. Muñoz-Moreno (1), Theodore C.K. Cheung (2), Kalliopi Megari (3), Joanne Festa (4), Emilia Łojek (5), Dora Kanellopoulos (6), Hetta Gouse (7), Bernice A. Marcopulos (8), Lucette A. Cysique (9)

1. **Relevant Cross-Cultural Aspects in NeuroCOVID: Primary Considerations from the NeuroCOVID INS SIG.**
Jose A. Muñoz-Moreno, Barcelona, Catalonia, Spain

2. Inside Out and Upside Down: How COVID-19 Pandemic Has Been Affecting the Mental Health of Children and Youth.
Theodore C.K. Cheung, Toronto, Canada

3. **Neurocognitive Rehabilitation of Post-COVID-19 Patients: Review of International Perspectives.**
Kalliopi Megari, Athens, Greece

4. Neurocognitive Profiles of Adult COVID-19 Long Haulers from a Multi-Center Health System in New York.
Joanne R. Festa, New York, USA

5. Olfactory and Neurocognitive Function in Adult COVID-19 Survivors. A Multi-Center Study Online.
Emilia Łojek, Warsaw, Poland