

# INPLASY

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## Neurological complications associated with Respiratory Syncytial Virus Infections: a scoping review of prospective clinical trials conducted in populations up to 17 years of age

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## ADMINISTRATIVE INFORMATION

**Support** - None.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202510017

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 6 January 2025 and was last updated on 6 January 2025.

## INTRODUCTION

**Review question / Objective** To identify the available data from prospective clinical trials conducted in populations up to 17 years of age that correlate the respiratory syncytial virus infection with any neurological and/or cognitive symptoms.

**Background** Human respiratory syncytial virus (RSV) is the primary cause of lower respiratory tract infections, such as pneumonia and bronchiolitis, in children under two years old and the elderly. In younger populations, RSV infection leads to high hospitalization rates in infants and even healthy children without significant comorbidities, regardless of their baseline health conditions, resulting in elevated morbidity and mortality.

Growing evidence indicates that respiratory syncytial virus infections may be linked to neurological complications including meningoencephalitis, encephalopathy, seizures, and status epilepticus.

**Rationale** Although recent systematic reviews have been published on the occurrence of Central Nervous System complications due to Respiratory Syncytial Virus, to the best of our knowledge, there is a gap in the literature regarding a focused review of well-designed prospective clinical trials in younger populations. Therefore, the aim of this scoping review was to explore the literature for prospective clinical trials involving infants, children, and adolescents up to 17 years of age, specifically addressing neurological and cognitive complications associated with respiratory syncytial virus infection.

## METHODS

**Strategy of data synthesis** This scoping review was conducted according to the recommendations of the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews). The following databases were thoroughly searched: MEDLINE (via PubMed), Scopus, the Cochrane Library, and PsycINFO. The search algorithm included a combination of the

keywords and their synonyms which are presented in the supplementary materials. The research was last updated on 26th November 2024.

**Eligibility criteria** Studies reporting results in infants, children and adolescents up to 17 years of age were considered eligible. Any neurological or cognitive outcome potentially associated with a positive RSV infection was considered as outcome of interest. Language and study type restrictions were applied, including only articles published in English and prospective clinical trials. Other types of trials were excluded, as well as reports referring to the peripheral and autonomic nervous system. Studies that did not report neurological or cognitive outcomes were excluded.

**Source of evidence screening and selection** Titles and abstracts were screened for relevance and a full-text control was applied for all potentially eligible studies. Duplicate articles were removed. Two studies described a common subset of the same patients and in this case the most recent study was included. Data from the included studies were extracted into a Microsoft Word document in the form of a table.

**Data management** MEDLINE was screened via the following PubMed Search Algorithm:

("Respiratory Syncytial Viruses"[MeSH Terms] OR ("respiratory"[All Fields] AND "syncytial"[All Fields] AND "viruses"[All Fields]) OR ("Respiratory Syncytial Viruses"[All Fields] OR ("respiratory"[All Fields] AND "syncytial"[All Fields] AND "virus"[All Fields]) OR ("respiratory syncytial virus"[All Fields] OR ("syncytial"[All Fields] AND "virus"[All Fields] AND "respiratory"[All Fields]) OR ("syncytial virus respiratory"[All Fields] OR ("syncytial"[All Fields] AND "viruses"[All Fields] AND "respiratory"[All Fields]) OR ("virus"[All Fields] AND "respiratory"[All Fields] AND "syncytial"[All Fields]) OR ("viruses"[All Fields] AND "respiratory"[All Fields] AND "syncytial"[All Fields]) OR "viruses respiratory syncytial"[All Fields])))) AND ("Central Nervous System"[MeSH Terms] OR ("central"[All Fields] AND "nervous"[All Fields] AND "system"[All Fields]) OR "Central Nervous System"[All Fields] OR "Central Nervous System"[All Fields] OR "neurological"[All Fields] OR "neurological manifestation"[All Fields] OR "neurological complication"[All Fields] OR "brain"[All Fields] OR "spinal cord"[All Fields] OR "cerebral"[All Fields] OR "neurologic"[All Fields] OR "encephalopathy"[All Fields] OR "seizures"[All Fields] OR "convulsion"[All Fields] OR "convulsions"[All Fields] OR "neurologic disease"[All Fields])

Scopus Search Algorithm:

( TITLE-ABS-KEY ( cns ) OR TITLE-ABS-KEY ( "central nervous system" ) OR TITLE-ABS-KEY ( "cognitive impairment" ) OR TITLE-ABS-KEY ( "central nervous system dysfunction" ) OR TITLE-ABS-KEY ( encephalitis ) OR TITLE-ABS-KEY ( encephalopathy ) OR TITLE-ABS-KEY ( seizures ) OR TITLE-ABS-KEY ( "neurological disorders" ) OR TITLE-ABS-KEY ( neurological AND disease ) AND TITLE-ABS-KEY ( "respiratory syncytial virus infection" ) ) AND ( LIMIT-TO ( OA , "all" ) )

The research was last updated on 26th November 2024.

**Reporting results / Analysis of the evidence** A narrative synthesis of the data was performed, describing the current knowledge derived from prospective trials in relation to the expression of respiratory syncytial virus in the central nervous system.

**Presentation of the results** A total of 765 reports emerged from the initial search across the databases. After excluding duplicate records, ineligible records by automation tool in Scopus, and reports that did not meet the inclusion criteria, a final total number of 11 articles were analyzed in the review.

**Language restriction** English.

**Country(ies) involved** Greece.

**Keywords** respiratory syncytial virus; neurological complications, infants, encephalopathy, prospective clinical trials, scoping review.

**Dissemination plans** PubMed publication and abstract submission in a Greek and a European conference.

**Contributions of each author**

Author 1 - Aikaterini Stravoravdi - Conceptualization, methodology, formal analysis, data curation, writing—original draft preparation, project administration.

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