

In The Name of God



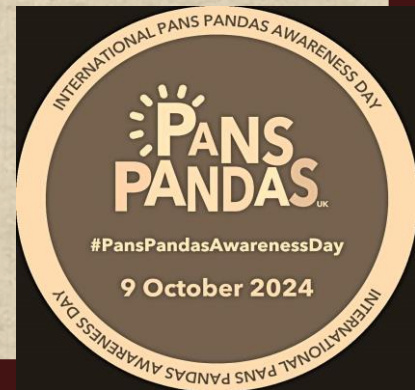


سندرم حاد نوروسایکیاتری کودکی (PANS)

و

علائم اختلالات خوردن ناشی از آن

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restricted intake

OCD and/or restrictive food intake...



OCD

...as well as two or more of the following symptoms:



emotional lability



aggression



depression



irritability



deterioration in school work



oppositional behaviors



urinary



irritability



cleanliness



sensory



sensory



irritability

Why Diagnosis Matters

Lack of clarity about the potential causes of PANS

No Listing of PANS in the DSM-V or ICD-11 coding system

Characterized as being a “diagnosis of exclusion”

The average child experiences multiple infections a year (including streptococcal infections)

Pediatric anxiety and tic disorders occur frequently

- *Most psychiatrists don't consider infections in their evaluation.*
- *PANS & PANDAS look like psychiatric disorders on the surface.*
- *There is no gold-standard test.*
- *Some children don't have evidence of an infection at the time of diagnosis.*
- *Some clinicians are understandably hesitant to diagnose a condition that may lead to antibiotics and steroid treatments without a clear diagnosis.*



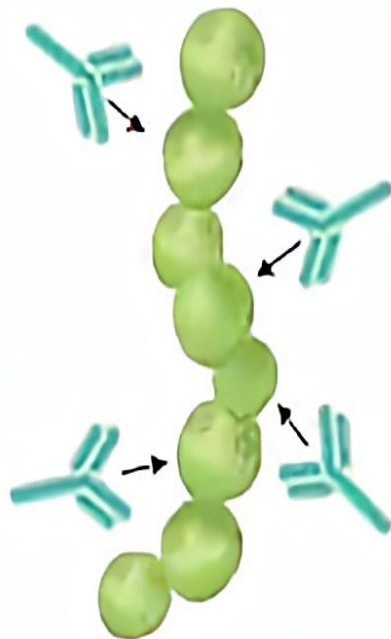
World PANS PANDAS Awareness Day



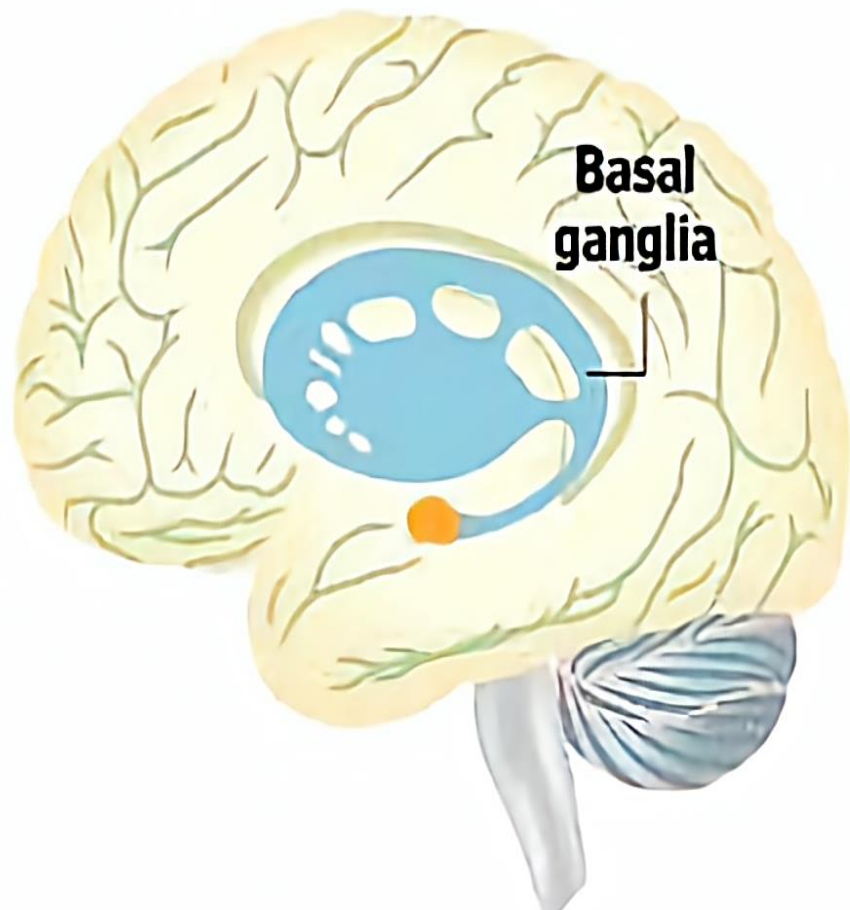
Pathogens



Immune system

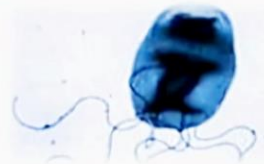
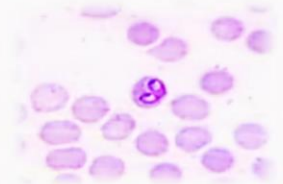
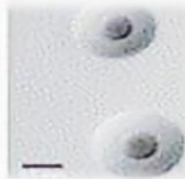
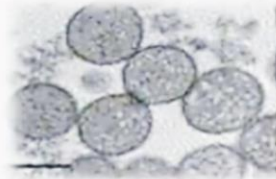
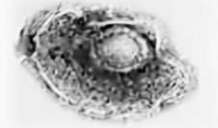
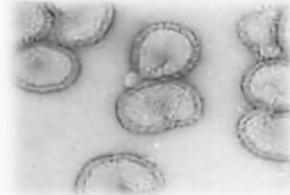


Basal ganglia



Some Infectious Triggers that are Associated with PANDAS or PANS

- **Group A streptococci**
- **Influenza A**
- **Varicella (chickenpox)**
- **Mycoplasma**
- **Lyme disease**
- **Babesia**
- **Bartonella**
- **Coxsackie virus**



Post-infectious Autoimmunity and/or Neuroinflammation are found in more than 80% of PANS cases.

Below are some of the most known triggers. It is not meant to be a comprehensive list and does not mean another infection may have triggered PANS symptoms.

Infectious Triggers

- Strep – (PANDAS)
- Mycoplasma Pneumonia
- Tick-borne illness (Lyme, B. miyamotoi, Bartonella, etc)
- Coxsackie virus
- Upper respiratory infections
- Epstein Barr virus
- Sinus infections
- COVID-19
- Influenza
- Other infections

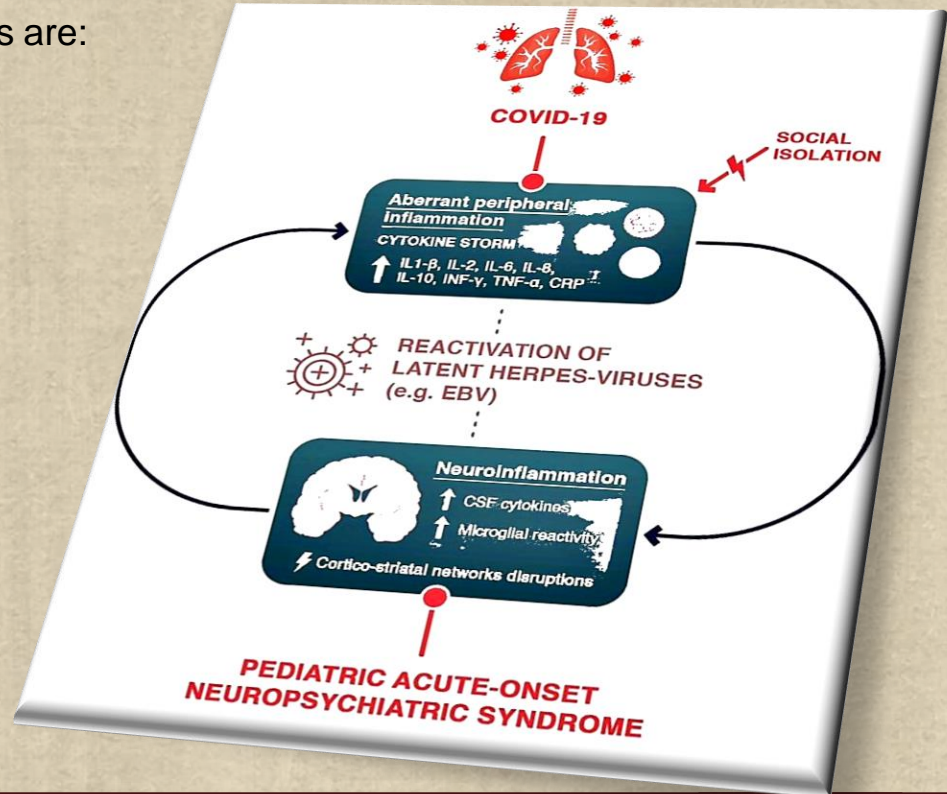
Non-Infectious Triggers

- Mold
- Environmental toxins
- Metabolic imbalances
- Endocrine imbalances
- Psycho-Social stress

Infections, **metabolic** disturbances, other inflammatory reactions, and **stress** can trigger PANS.

The most documented infectious triggers are:

- Strep**
- Common Cold**
- Sinusitis**
- Middle Ear Infections**
- Upper Respiratory Infections**
- Mycoplasma pneumonia**
- Lyme borreliosis**
- Bartonella**
- Varicella**
- Epstein-Barr virus**
- Enterovirus**
- Coxsackievirus**
- Influenza**
- Dental Infections**
- Herpes Simplex**
- Gastrointestinal Infections**



PANDAS

- 1) Presence of OCD or tic disorder
- 2) Prepubertal onset
- 3) **ACUTE** onset and episodic, relapsing-remitting course
- 4) Association with neurological abnormalities (choreiform movements)
- 5) Temporal relationship between symptoms exacerbations and Group A Streptococcal infections

REFERENCES: Swedo *et al.* 1998, 2004, 2012

PANS

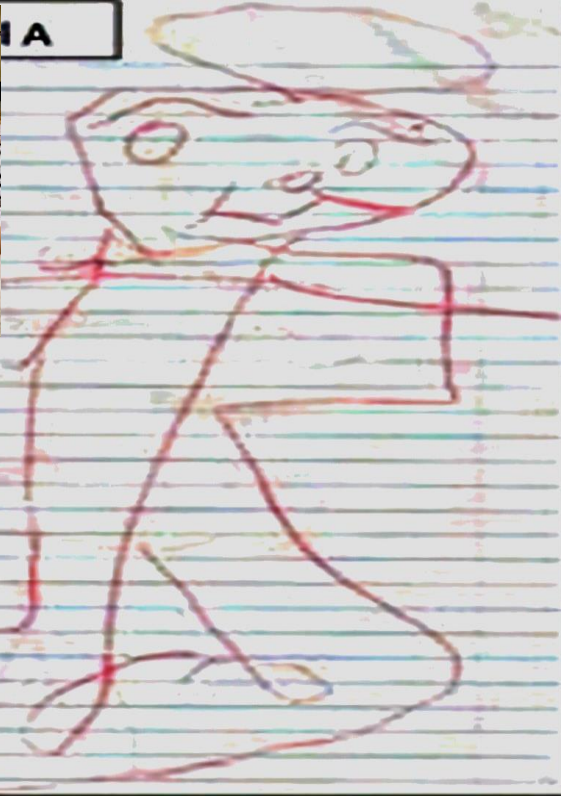
- 1) **ACUTE** onset of OCD or Eating restrictions
- 2) Concurrent onset of at least two of the following:
 - Anxiety (esp. separation anxiety)
 - Behavioral/developmental regression
 - Emotional lability or depression
 - Irritability, aggression and/or severely oppositional behavior
 - Deterioration in school performance
 - Sensory or motor abnormalities
 - Somatic signs/symptoms, especially insomnia and urinary symptoms
- 3) Symptoms are not better explained by a known neurologic or medical disorder, such as Sydenham chorea, autoimmune encephalitis or Tourette disorder.



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Panel A— Drawing produced during an acute exacerbation of OCD and other symptoms of PANDAS which appears quite messy and immature.

Panel B — Age-appropriate picture drawn after treatment with IVIG and symptomatic improvement.

OCD

OR

Food
restriction



Two or more:

- Sensory & motor abnormalities
- Deterioration in school performance
- Sleep disturbance
- Enuresis/ urinary frequency
- Developmental regression
- Anxiety
- Irritability
- Aggression
- Oppositional behaviours

The rate of eating disorders in children is ***increasing***, especially in ***males***.

“Between 1999 and 2006, there was an ***119%*** increase in eating disorder-related hospitalizations for children ***< 12*** years of age.” This increase may be linked to ***PANS***.

new abrupt onset of eating restriction or food avoidance,

Age at onset

Male predominance

acuity of symptom onset & ***comorbid neuropsychiatric symptoms***

Roughly 50% of PANS patients : some degree of restrictive eating
Approximately **1 in 5** :restricted intake of **specific** foods or **all** food group
often with observable **weight loss** and occasionally with **dehydration**
About 17% will have life-threatening issues

Restrictive eating can include both **food** and **fluids**
Can includes avoidance of **particular** foods and fluids and restricting the **intake amount**

Restricted Eating Can Lead :

- Nutritionally deficiency
- Significant weight loss or Failure to gain weight
- Psychosocial functioning or Developmental delays
- Gastrointestinal complications



For many, food restrictions are firmly rooted in OCD, a primary PANS symptom

But distorted body images, especially in patients who have had PANS PANDAS for several years
More often in older patients, but it can happen in younger patients

Fear: Contamination

Germs
41%

Poisoning
10%

Other*
14%

Fear: Vomiting

28%

*allergens, bleach, illicit drugs, "the essence & personality of other people"

Fear: Choking

21%

Refused to swallow own saliva

17%

Refused all food - at least several days

17%

Body Image issues - weight or shape

10%

Sensory sensitivity (not just intake)

41%

Treatment of Restricted Eating Due to PANS PANDAS

Three-pronged approach:

- 1- Remove the source of inflammation with antimicrobials (if triggered by an infection)
- 2- Treat the dysregulated immune system with immune modulators and/or anti-inflammatories depending on severity
- 3-Treat symptoms psychotherapeutically

Antibiotics, IVIG, and/or steroids

Focus on maintaining adequate nutrition and hydration

Treating underlying brain inflammation

Medical work up to assess for other medical disorders

During the acute phases feeding tubes may be necessary

Feeding Therapy to target factors contributing to ongoing restricted intake

Exposure and Response Prevention (ERP)

Gradual exposure to situations and food

Incremental progress towards increasing intake and expanding diet

Cognitive Behavioral Therapy (CBT)

Occupational Therapy (OT)

Family Therapy





Symptomatic Relief

Psycho-Therapeutic

Therapy

- Cognitive Behavior(CBT)
- Parent Management Techniques (PMT)
- School-Based

Psychotropic Medications

- "Start Low & Go Slow" approach
- Symptom specific



Inflammatory Source

Anti-Microbial

Antibiotics

- Therapeutic or prophylactic

Other Anti-Microbials

- Anti-virals or
- Anti-fungals
- if the trigger is not a bacterial infection



Immune Dysregulation

Immunomodulation

Anti-Inflammatories

- NSAIDs
- Steroids

Immunomodulatory Agents

- IVIG
- Plasmapheresis
- Rituximab
- Cellcept



Other Considerations

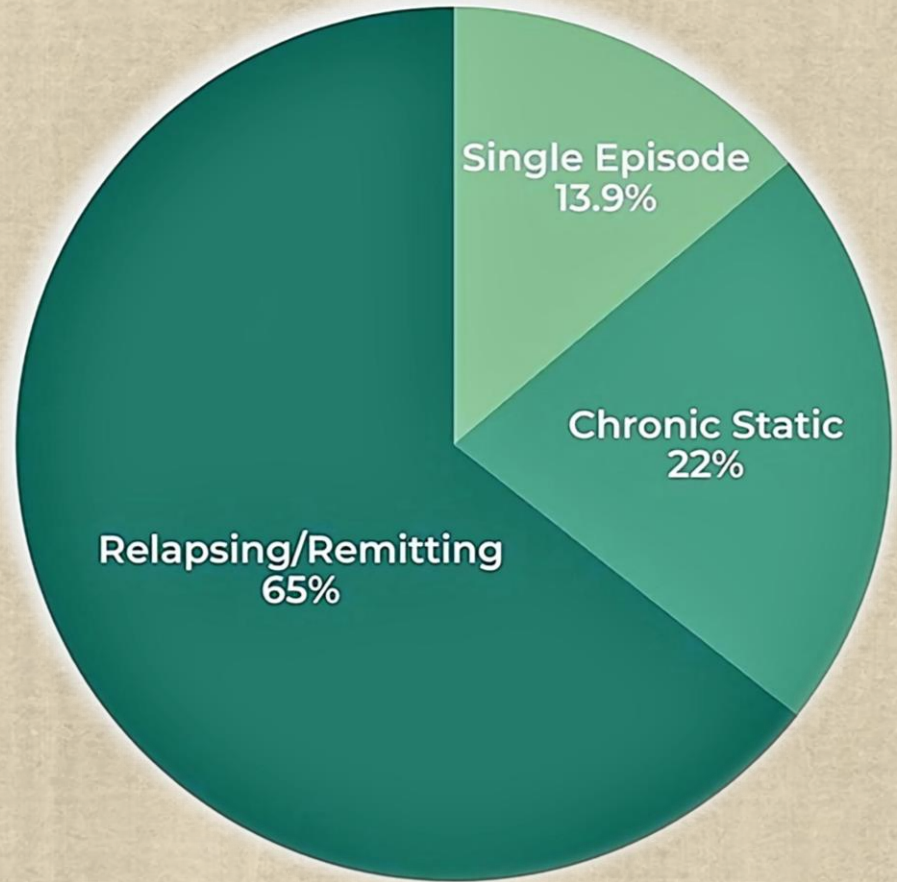
Supportive

- Tonsillectomy & Adenoidectomy
- Antihistamines (H1 & H2 Blockers)
- Vitamin D3, Omegas
- Dietary Changes

Approximately one third have a chronic-progressive course while two thirds have a relapsing-remitting course.

The most commonly reported symptoms of relapse are OCD and tics.

Unrecognized and untreated exacerbations of PANS and PANDAS appear to increase the likelihood of OCD and tic manifestations during adulthood.



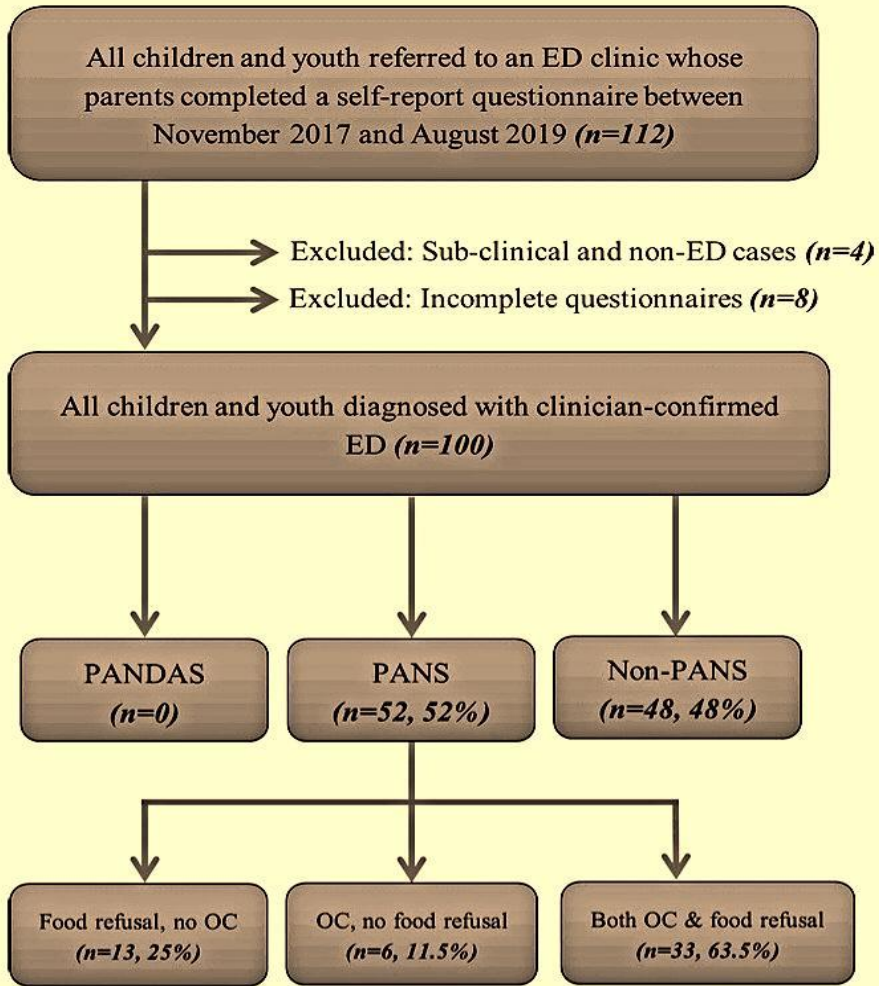
RESEARCH

Open Access



Prevalence of pediatric acute-onset neuropsychiatric syndrome (PANS) in children and adolescents with eating disorders

Marya Aman^{1,2}, Jennifer S. Coelho^{1,2,3}, Boyee Lin^{1,2}, Cynthia Lu^{1,2}, Clara Westwell-Roper^{1,2}, John R. Best^{1,2} and S. Evelyn Stewart^{1,2,4*}



52% PANS

Abrupt-onset
both food restriction & OC
63.5%

food restriction 25%

OC symptoms 11.5%

PANS group:

more:

Female

prescribed an SSRI

abrupt OC symptom onset

abrupt food refusal

relapsing & remitting course

Concurrent Anxiety/ Depression/ Irritability /Aggression/ Behavioral regression /School deterioration / Sleep problems/ Enuresis

Not significant group differences for:

onset age





BMI

eating disorder type

comorbid psychiatric/medical/autoimmune illness

REVIEW

Abrupt onset or exacerbation of anorexia nervosa following recent infections: a mini-review and a case report with an atypical manifestation of PANS

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30 cases derived from six studies

suggesting AN can manifest as PANS/PANDAS

mainly **adolescents**

sudden or **exacerbated** eating restrictions alongside & obsessive-compulsive behaviors

In some cases, the **infection is present**, in others it is not;
in some cases, the onset is without any **previous symptoms**, in other cases, the infection seems to exacerbate the symptoms already present;
in some cases there is a clear recent **history of infection**, in other cases the history is less clear.
the better conclusion is that the nexus of infection, immunology, and mental illness has been **inadequately described and explored** (complex)

infectious diseases

triggers of **autoimmune** processes, which can lead to AN or other restrictive behaviors
lead subjects to a first experience of weight loss, subsequently triggering the onset & maintenance (**psychological** level) of eating restrictions

PANDAS/PANS



Oppositional Defiance

Separation Anxiety

Eye Rolling

ANGER

Fear

Brain Fog

Mood Swings

Motor Tics

Memo

O

Anxiety

Insomn

Vod

Thank you for your attention

