



Susan E. Swedo, M.D.
Section on Behavioral Pediatrics
National Institute of Mental Health
National Institutes of Health

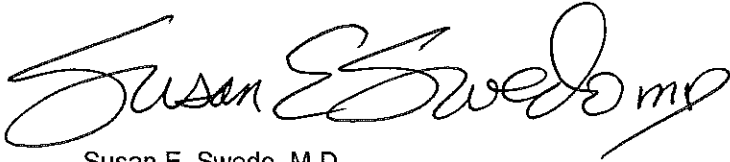
May 4, 2017

Intravenous immunoglobulin (IVIG) is widely accepted as a standard treatment for post-infectious autoimmune encephalopathy.¹ Two types of autoimmune encephalopathy are produced by infections with Group A streptococcal bacteria: Sydenham chorea (the neurologic manifestation of acute rheumatic fever) and PANDAS (Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal infections).² In randomized controlled trials, IVIG has been shown to be useful in reducing symptom severity and shortening the course of illness in both disorders.³⁻⁵ IVIG also has been used with benefit in hundreds of cases of immune-related Pediatric Acute-onset Neuropsychiatric Syndrome (PANS). Thus, the PANS/PANDAS Treatment Guidelines recommend consideration of its use for treatment of all moderate-severe cases of PANS/PANDAS (see attachment).⁶⁻⁷

Development of the PANS/PANDAS treatment guidelines began in May 2014 at a meeting held at the National Institutes of Health in Bethesda, Maryland. Refinements and modifications were made over the ensuing two years by three workgroups of the PANS/PANDAS Clinical Research Consortium; they separately addressed 1) use of psychiatric medications and behavioral interventions; 2) use of antimicrobials; and 3) use of anti-inflammatory and immunomodulating therapies. The three workgroups followed similar procedures, first reviewing the published literature and drawing upon their combined clinical experience with more than 1,000 children with PANS/PANDAS to formulate an initial set of recommendations, which were then sent to a separate group of expert clinicians for critical review and comment. The members of the three workgroups and the expert review panels include the following:

Dritan Agalliu (Columbia University)	Gail Bernstein (Univ Minnesota)
David Brick (Beth Israel Medical Center)	Reuven Bromberg (Miami Children's)
Kiki Chang (Stanford University)	Harry Chugani (DuPont Hosp. for Children)
Michael Cooperstock (Univ Missouri)	Dan Cury (Nationwide Children's Hosp.)
Madeleine Cunningham (Univ Oklahoma)	Tyler Cutforth (Columbia Univ)
Michael Daines (Univ Arizona)	Russell Dale (Univ New South Wales, Australia)
Josephine Elia (DuPont Hosp for Children)	Bahare Farhadian (Stanford Univ)
Jenny Frankovich (Stanford Univ)	Robert Fryer (Columbia Univ)
Hayley Gans (Stanford Univ)	Daniel Geller (MGH/Harvard Univ)
Jay Giedd (UCSD)	Paul Grant (NIMH)
Earl Harley (Georgetown)	Joseph Hernandez (Stanford Univ)
Rebecca Hommer (NIMH)	Mady Hornig (Columbia Univ)
Cynthia Kappahn (Stanford Univ)	Miro Kovacevic (Loyola Univ)
Elizabeth Latimer (Georgetown Univ)	Bryan King (UCSF)
James Leckman (Yale Univ)	Eyal Muscal (Baylor Univ)
Tanya K Murphy (Univ South Florida)	Mark Pasternack (MGH/Harvard Univ)
Sydney Rice (Univ Arizona)	Alan Rosenberg (Univ Saskatchewan)
Terence Sanger (USC)	Richard Shaw (Stanford Univ)
Michael Sherman (Univ Missouri)	Janell Sherr (Stanford Univ)
Susan Swedo (NIMH)	Margo Thienemann (Stanford Univ)
Wendy Vargas (Columbia Univ)	Theresa Willet (Stanford Univ)
Kyle Williams (MGH/Harvard Univ)	Yujuan Zhang (Tufts Univ)

The 44 contributors represent 23 different academic institutions from across the US, Canada and Australia, and include not only clinicians with expertise in the diagnosis and treatment of PANS/PANDAS, but also experts in the fields of child psychiatry, pediatrics, infectious diseases, microbiology, neurology, neuroimmunology, immunology and rheumatology. The contributing authors and all members of the PANS/PANDAS Clinical Research Consortium unanimously approved the final sets of guidelines. Thus, the guidelines truly represent a national standard of care, and the use of IVIG for moderate-severe PANS/PANDAS has been endorsed as a "best practice" by clinicians from all across the US and beyond.



Susan E. Swedo, M.D.
Chair, PANS/PANDAS Clinical Research Consortium

References:

¹Kalman B. Autoimmune Encephalitides: A broadening field of treatable conditions. *Neurologist* 22(1):1-13, January 2017

²Williams KA, Swedo SE. Post-infectious autoimmune disorders: Sydenham's chorea, PANDAS and beyond. *Brain Res* 1617:144-54, 2015.

³Garvey MA, Snider LA, Leitman SF, Werden R, Swedo SE. Treatment of Sydenham's chorea with intravenous immunoglobulin, plasma exchange or prednisone. *J Child Neurol* 20:424-429, 2005.

⁴Perlmutter SJ, Leitman SF, Garvey MA et al. Therapeutic plasma exchange and intravenous immunoglobulin for obsessive-compulsive disorder and tic disorders in childhood. *Lancet* 354:1153-1158, 1999.

⁵Williams KA, Swedo SE, Farmer CA et al. Randomized, controlled trial of intravenous immunoglobulin for pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS). *J Am Acad Child Adolesc Psychiatry* 55(10):860-867, 2016.

⁶Swedo SE, Frankovich J, Murphy TK. Treatment of pediatric acute-onset neuropsychiatric syndrome (PANS). *J Child Adolesc Psychopharmacology*, In press, 2017.

⁷Frankovich J, Swedo SE, Murphy TK. Clinical management of pediatric acute-onset neuropsychiatric syndrome (PANS): Part II – Use of immunomodulatory therapies. *J Child Adolesc Psychopharmacology*, In press, 2017.

Attachment - Excerpts from "Treatment of PANS"⁶ and "Use of immunomodulatory therapies"⁷