Comprehensive Model for the Treatment and Management of Complex Autism Spectrum Disorder

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Objectives
Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder with heterogeneity in symptom presentation and increasing prevalence, with 1 in 44 children being diagnosed worldwide. Notably, 70% of individuals with ASD have at least one comorbid psychiatric diagnosis, and half have two or more. It is crucial to adopt a concise and patient-centered approach to recognizing and managing ASD comorbidities. While traditional models have primarily focused on behavioral and social interventions, more research is needed managing comorbidities using pharmacotherapy in psychiatry care practice. To bridge this gap, we propose a one-page model for the management of ASD that integrates established behavioral interventions and support services with various pharmacological treatments. This model is driven by longitudinal clinical experience and supported by a thorough literature review.

Methods
A comprehensive and systematic search of published studies on autism management with appropriate combination of terms, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, was conducted on PubMed, APA PsycInfo, Cochrane Library, and Embase databases from inception to May 2023. The initial screen included 2,462 articles. After eliminating based on titles and abstracts, 64 articles including book chapters were reviewed.

Results
Our one-page comprehensive model, supported by 64 citations, encompasses the following five treatment domains; 1) Psychosocial and Psychological interventions to target core behavioral symptoms; 2) Individualized Education Plans to address the unique learning needs of individuals with ASD; 3) Assistive Technology and Sensory Integration Therapy to enhance social communication, language development, and address sensory sensitivities, respectively; 4) Pharmacotherapy to address psychiatric and medical comorbidities; 5) Supportive Services such as parent or caregiver training, and transitional planning.

Conclusions
Based on these results, we present a one-page comprehensive model that addresses the multifaceted nature of ASD. By combining evidence-based practices and emerging research, this model promotes interdisciplinary approach across multiple domains and contributes to advancing complex ASD treatment and management.

References

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Comprehensive Model™ for the Treatment and Management of Complex Autism Spectrum Disorder

Psychological and Psychosocial Therapeutic Interventions
Applied Behavior Analysis (ABA) Therapy[39,63,64] to help develop adaptive behaviors, communication & social skills
CBT Therapy[40] for anxiety & depression
Social Skills Therapy[41,42] to improve social perceptions and interactions
Assistive Technology[43,44] for visual support, communication devices (PECS, CAT), specialized apps, to enhance social, communicative and language development
Transitional Planning and Daily Living Skills[45] Job-coaching and employment Programs[46]
Parent and Caregiver Training[47] Teaching parent techniques to improve child behavior and learn new skills. (Parent Management Training, Parent-Lead ABA)
Intensive Outpatient Programs:
MAXOut intensive outpatient treatment[48]
DBT-skills training in group settings[49]

School/Life Accommodations under IEP Plan[50]

Early Start Denver Model[17,63,64] < 5YO
↓
Special Ed Classroom
↓
Therapeutic Day School
↓
Therapeutic Residential School
↓
Specialized Psychiatry Hospital Units for ASD - Multi-modal approach to treatment[62]
↓
Residential Group Homes[51,52]
Residential Treatment Programs[61]

Medical Insurances
School District funds
State funds
Nonprofit and Charity Organizations[53,54]

Deficiency in *reciprocal social behaviors* is the *sine qua non* of ASD.[6,61] Impairment in SCI and RRB cause significant inability to understand, communicate or interact properly with social & occupational Environment

↓ Antecedents[55]

Difficulties to process or self-regulate[7,8,61]
↓ Discomfort
↑ Frustration

ASD[1,2,5]
Deficits in Social Communication and Interaction(SCI)[3]
1. Deficit in social-emotional Reciprocity
   Reduced sharing of Interests, emotions, or affect
   Failure to initiate or respond to social interactions
2. Deficits in nonverbal communicative behaviors
   Abnormal eye contact and body language
   Deficits in understanding and use of gestures
   Lack of facial expressions & nonverbal communications
3. Deficits in developing, maintaining, understanding relationships
Restricted, Repetitive Behaviors, Interests, Activities(RRB)[4]
1. Stereotyped repetitive motor movements
2. Inflexible adherence to routines, ritual patterns
3. Highly restricted and fixated interests
4. Hyper or hyporeactivity to sensory input

Medical Comorbidities[15,16]
Seizures, Genetic D/0, GI D/O, Metabolic Abnormalities, Immune/inflammatory D/O, Autonomic & HPA Dysfunction Sleep disorders

Other medications under investigation for ASD comorbidities[38,61]
Levetiracetam, N-Acetylcysteine
Intranasal Oxytocin, Probiotics
Intranasal Vasopressin
Bumetanide, Prednisone, Folinic Acid
Omega 3, Methyl B12, Vit D

↑Anxiety[9,61]
Social, GAD, OCD, PTSD

ADHD[9,10]
Executive Functioning

Tourette's[11]
Motor & Vocal Tics

Sensory Processing Impairments[12]

Speech & Language[13] Intellectual disability[14]

Speech & Language Therapy[37]

Pediatric & Adult Multispecialty Physician Team Collaborations[16]

Emotional Reaction[8]

Ruminative brooding[18,61]
Inflexible thinking
Extreme discomfort
Irritability
Self-injurious behaviors[19]
Suicidal behaviors[19]

Tx: SSRIs/SNRIs[21,22,23,24] for depression and anxiety, Long acting Benzos[57,58] for anxiety, Lorazepam PRN for overwhelming anxiety

Depressed Negative Mood[17]

Mood Dysregulation

DMDD &/or Bipolar like Aggressive Agitation[25]

ADHD Medications
Psychostimulants[30, 31]
Atomoxetine[32]
Guanfacine[33]
Clonidine[34]

Alpha-2-Agonists[35]
Guanfacine, Clonidine

Sensory integration and Occupational Therapy[36]

Protest Behaviors[61]
Explosive aggressive rages
Agitated irritability/tantrums
Aggression towards others
Violent physical behaviors
Deliberate self-injuriousness
Unable to soothe or self-regulate
Requires restraints at times

Tx: Atypical Antipsychotics[56]
(Risperidone[26], Aripiprazole[26])
Anticonvulsants[27,28] for aggressivity
Quetiapine[59] for ruminating aggressive thoughts.
Chlorpromazine[60] PRN for aggressive agitated rages
ECT in rare instances for severe aggressive or self-injurious behaviors with comorbid mood disorders or catatonia that are recalcitrant to treatment[29]

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