NATIONAL CLINICAL GUIDELINES

THE DIAGNOSIS & MANAGEMENT OF AUTISM SPECTRUM DISORDER

Ministry of Public Health

P.O. Box 42,
Doha, Qatar
Phone: (+974)4 407 0969
Email: clinicalguidelines@moph.gov.qa

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المبادئ الإرشادية السريرية لدولة قطر
NATIONAL CLINICAL GUIDELINES FOR QATAR

وزارة الصحـــــة العامـــــة
Ministry of Public Health
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View Pathway

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1.0	Final	21st October 2019	Guidelines Team	Final version for publication.

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Abbreviations

The abbreviations used in this guideline are as follows:

AAA	The Adult Asperger Assessment
ABA	Applied Behavioural Analysis
aCGH	Array Comparative Genomic Hybridization
ADHD	Attention-Deficit Hyperactivity Disorder
ADI-R	The Autism Diagnostic Interview-Revised
ADOS-G	The Autism Diagnostic Observation Schedule-Generic
AQ-10	Autism-Spectrum Quotient – 10 items
CAST	Childhood Autism Spectrum Test
CBT	Cognitive Behavioural Therapy
DIR	Developmental, Individual Differences, Relationship-Based Approach
DISCO	The Diagnostic Interview for Social and Communication Disorders
EEG	Electroencephalography
ESDM	Early Start Denver Model
ESI	Early Social Interaction
GI	Gastrointestinal
ID	Intellectual (learning) Disability
M-CHAT	Modified-Checklist for Autism in Toddlers
M-CHAT-R/F	Modified Checklist for Autism in Toddlers, Revised, with Follow-Up
MDT	Multidisciplinary Team
OCD	Obsessive-Compulsive Disorder

View Pathway

OT	Occupational Therapy
PDD-NOS	Pervasive Developmental Disorder Not Otherwise Specified
PECS	Picture Exchange Communication System
RPMT	Responsive Education and Prelinguistic Milieu Teaching
SCD	Social (pragmatic) Communication Disorder
SCQ	Social Communication Questionnaire
SLP	Speech and Language Pathology
SSRI	Selective Serotonin Reuptake Inhibitor
TEACCH	Treatment and Education of Autistic and Communication Related Handicapped Children

View Pathway

Table of Contents

View Pathway

View Pathway

1 Information About This Guideline

1.1 Objective and Purpose of the Guideline

The purpose of this guideline is to define the appropriate diagnosis and management of Autism Spectrum Disorder (ASD) in children and adults. The objective is to improve the early recognition and diagnosis of individuals with ASD, reduce inappropriate prescribing, improve referral of patients presenting to provider organisations in Qatar and the quality of care and support provided to people with Autism and their families. It is intended that the guideline will be used by healthcare professionals across all care settings.

1.2 Scope of the Guideline

The following aspects of care are included within this Guideline:

- Definition and classification of ASD.
- Symptoms and signs by age group.
- Assessment and investigation.
- Diagnostic criteria.
- Multidisciplinary management.
- Considerations for patient preferences in relation to care.
- Key Performance Indicators.

1.3 Editorial Approach

This guideline document has been developed and issued by the Ministry of Public Health of Qatar (MOPH), through a process which aligns with international best practice in guideline development and localisation. The guideline will be reviewed on a regular basis and updated to incorporate comments and feedback from stakeholders across Qatar.

The editorial methodology, used to develop this guideline, has involved the following critical steps:

- Extensive literature search for well-reputed published evidence relating to the topic.
- Critical appraisal of the literature.
- Development of a draft summary guideline.
- Review of the summary guideline with a Guideline Development Group, comprised of practising healthcare professionals, subject matter experts and patient representatives, from across Qatar.
- Independent review of the guideline by the National Clinical Guidelines & Pathways Committee, appointed by the MOPH, from amongst stakeholder organisations across Qatar.

Whilst the MOPH has sponsored the development of the guideline, the MOPH has not influenced the specific recommendations made within it.

1.4 Sources of Evidence

The professional literature has been systematically queried using specially developed, customised, and tested search strings. Search strategies are developed to allow efficient yet comprehensive analysis of relevant publications for a given topic and to maximise retrieval of articles with certain desired characteristics pertinent to a guideline.

View Pathway

For each guideline, all retrieved publications have been individually reviewed by a member of the Editorial Team and assessed in terms of quality, utility, and relevance. Preference is given to publications that:

1. Are designed with rigorous scientific methodology.
2. Are published in higher-quality journals.
3. Address an aspect of specific importance to the guideline in question.

Further information about the literature search and appraisal process is included in the appendix.

1.5 Evidence Grading and Recommendations

Recommendations made within this guideline are supported by evidence from the medical literature and where possible the most authoritative sources have been used in the development of this guideline. In order to provide insight into the evidence basis for each recommendation, the following evidence hierarchy has been used to grade the level of authoritativeness of the evidence used, where recommendations have been made within this guideline.

Where the recommendations of international guidelines have been adopted, the evidence grading is assigned to the underlying evidence used by the international guideline. Where more than one source has been cited, the evidence grading relates to the highest level of evidence cited:

- **Level 1 (L1):**
  - Meta-analyses.
  - Randomised controlled trials with meta-analysis.
  - Randomised controlled trials.
  - Systematic reviews.

- **Level 2 (L2):**
  - Observational studies, examples include:
    - Cohort studies with statistical adjustment for potential confounders.
    - Cohort studies without adjustment.
    - Case series with historical or literature controls.
    - Uncontrolled case series.
  - Statements in published articles or textbooks.

- **Level 3 (L3):**
  - Expert opinion.
  - Unpublished data, examples include:
    - Large database analyses.
    - Written protocols or outcomes reports from large practices.

In order to give additional insight into the reasoning underlying certain recommendations and the strength of recommendation, the following recommendation grading has been used, where recommendations are made:

- **Recommendation Grade A (RGA):** Evidence demonstrates at least moderate certainty of a net benefit from the recommendation.
- **Recommendation Grade B (RGB):** Evidence is insufficient, conflicting, or poor and demonstrates an incomplete assessment of net benefit vs harm; additional research is recommended.
- **Recommendation Grade C (RGC):** Evidence demonstrates potential harm that outweighs benefit; additional research is recommended.
- **Recommendation of the GDG (R-GDG):** Recommended best practice on the basis of the clinical experience of the Guideline Development Group members.

View Pathway

1.6 Guideline Development Group Members

The following table lists members of the Guideline Development Group (GDG) nominated by their respective organisations and the Clinical Governance Group. The GDG members have reviewed and provided feedback on the draft guideline relating to the topic. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

Guideline Development Group Members		
Name	**Title**	**Organisation**
Dr Nazim Haidar Mohammed Salih Abdel Aati	Consultant, Developmental Paediatrics Assistant Professor Clinical Paediatrics	Child Development Center, HMC
Dr Taiseer Abdel Raouf Ahmed	Consultant Paediatrician	Qatar Petroleum
Dr Nahed Alateeqi	Senior Attending Physician, Assistant Professor of Clinical Paediatrics	Sidra Medicine
Dr Amani Hussain Al Yafei	Consultant, Family Medicine	Primary Health Care Corporation
Dr Atiya Bashir	Consultant Paediatrician	Al Ahli Hospital
Ms Siobhan Crowley-Bryan	Occupational Therapist	Sidra Medicine
Ms Rabie Attwa Elsayed	Pharmacist	Primary Health Care Corporation
Dr Mohamed El Tahir	Senior Consultant, Learning Disability	Mental Health Services, HMC
Sr Noora Ferchichi	Staff Nurse	Primary Health Care Corporation
Dr Khalid A. Hadi	National Lead for Health & Wellbeing of People with Special Needs, Senior Consultant, Head of Audiology & Balance Unit	Ambulatory Care Center, HMC
Dr Amira Hassan	Senior Psychologist	Child Development Center, HMC
Dr Maria Fatima Janjua	Division Chief, Developmental Paediatrics	Sidra Medicine
Dr Vinod Jacob	Paediatrician	Aster DM Healthcare
Dr Masoud Ahmed Masoud Khalil	Senior Psychologist, Autism Programme Supervisor	The Qatar Institute for Speech and Hearing
Dr Yasser Khan	Consultant Psychiatrist	Child and Adolescent Mental Health Services, HMC
Mrs Rehab Lasheen	Patient Representative	-
Mr Sany Abdulraouf Mohamed	Senior Speech & Language Pathologist, Autism Programme Coordinator	The Qatar Institute for Speech and Hearing
Mr Hossam T. Mehana	Senior Behavioural Psychologist Autism Programme Coordinator	Child and Adolescent Mental Health Services, HMC

View Pathway

Guideline Development Group Members		
Name	**Title**	**Organisation**
Mrs Fatima Mustafa	Assistant Director, Paediatrics Rehabilitation	Child Development Center, HMC
Dr Aisha Khalifa Naemi	Consultant, Family Medicine	Primary Health Care Corporation
Dr Manal Osman	Associate Consultant Psychiatrist	Child and Adolescent Mental Health Services, HMC
Mr Lazarus Phiri	Clinical Nurse Specialist - CAMHS	Child and Adolescent Mental Health Services, HMC
Mrs Barea Zaid Qutish	Patient Representative	-
Dr Sona Tahtamouni	Consultant Paediatrician	Hamad Medical Corporation
Dr Mohamed Tolefat	Director of Medical & Rehabilitation Services	Shafallah Integration for the Disabled
Dr Erin Valentine	Clinical Psychologist	Sidra Medicine
Ms Chioma Nwatuobi Wallace	Supervisor, Speech Language Pathology	Sidra Medicine
Dr Monica Zolezzi	Assistant Professor, Clinical Pharmacy & Practice	College of Pharmacy, Qatar University

1.7 National Clinical Guidelines & Pathways Committee Members

The following table lists members of the National Clinical Guidelines & Pathways Committee (NCGPC), appointed by the MOPH. The NCGPC members have reviewed and provided their feedback and approval of the guideline document. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
Name	**Title**	**Organisation**
Ms Huda Amer Al-Katheeri	Chair of the NCGPC, Director of Strategic Planning & Performance Department	Ministry of Public Health
Shk Dr Mohammed Hamad J. Al Thani	Co-Chair of the NCGPC, Director of Public Health	Ministry of Public Health
Prof Anthony Akobeng	Chair Clinical Practice Guidelines Committee	Sidra Medicine
Dr Maryam Ibrahim Al-Heidous	Registration coordinator, QCHP	Ministry of Public Health
Dr Alshaymaa Mohammed A. M. Al-Motawa	Consultant Family Medicine	Qatar Petroleum
Dr Abi Khalil Charbel	Associate Professor of Medicine Consultant Cardiology	Weill Cornell Medicine-Qatar
Dr Paul Dijkstra	Director of Medical Education	Aspetar

View Pathway

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
Name	**Title**	**Organisation**
Dr Mohamed Elrishi	Consultant Endocrinology and Internal Medicine	Al Ahli Hospital
Dr Dahlia Mustafa Hassan	Consultant Family Medicine	Primary Health Care Corp
Dr Ghassan Youseph Hommos	Consultant Endocrinology	Al Emadi Hospital
Dr Chris Kenny	Executive Director Clinical and Service Development, Office of the Chief Medical Officer	Hamad Medical Corporation
Dr Egon Toft	VP and Dean of College of Medicine	College of Medicine, Qatar University

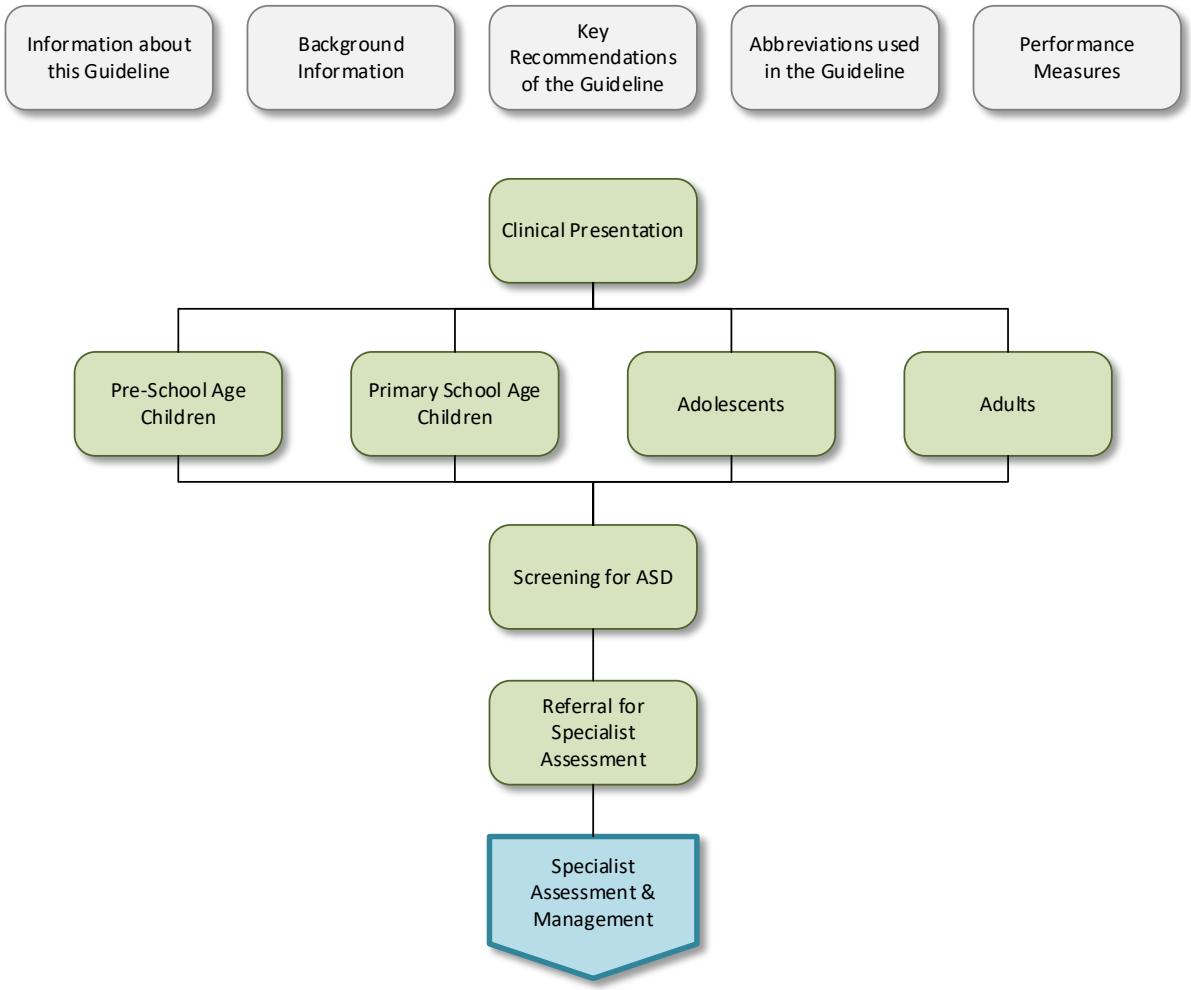
1.8 Responsibilities of Healthcare Professionals

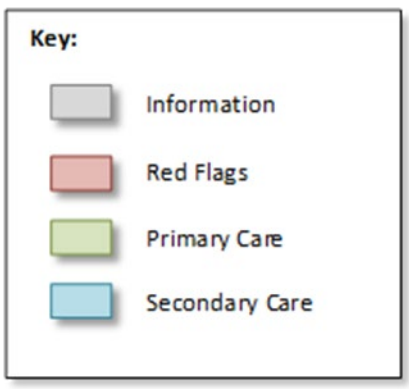
This guideline has been issued by the MOPH to define how care should be provided in Qatar. It is based upon a comprehensive assessment of the evidence as well as its applicability to the national context of Qatar. Healthcare professionals are expected to take this guidance into account when exercising their clinical judgement in the care of individuals presenting to them.

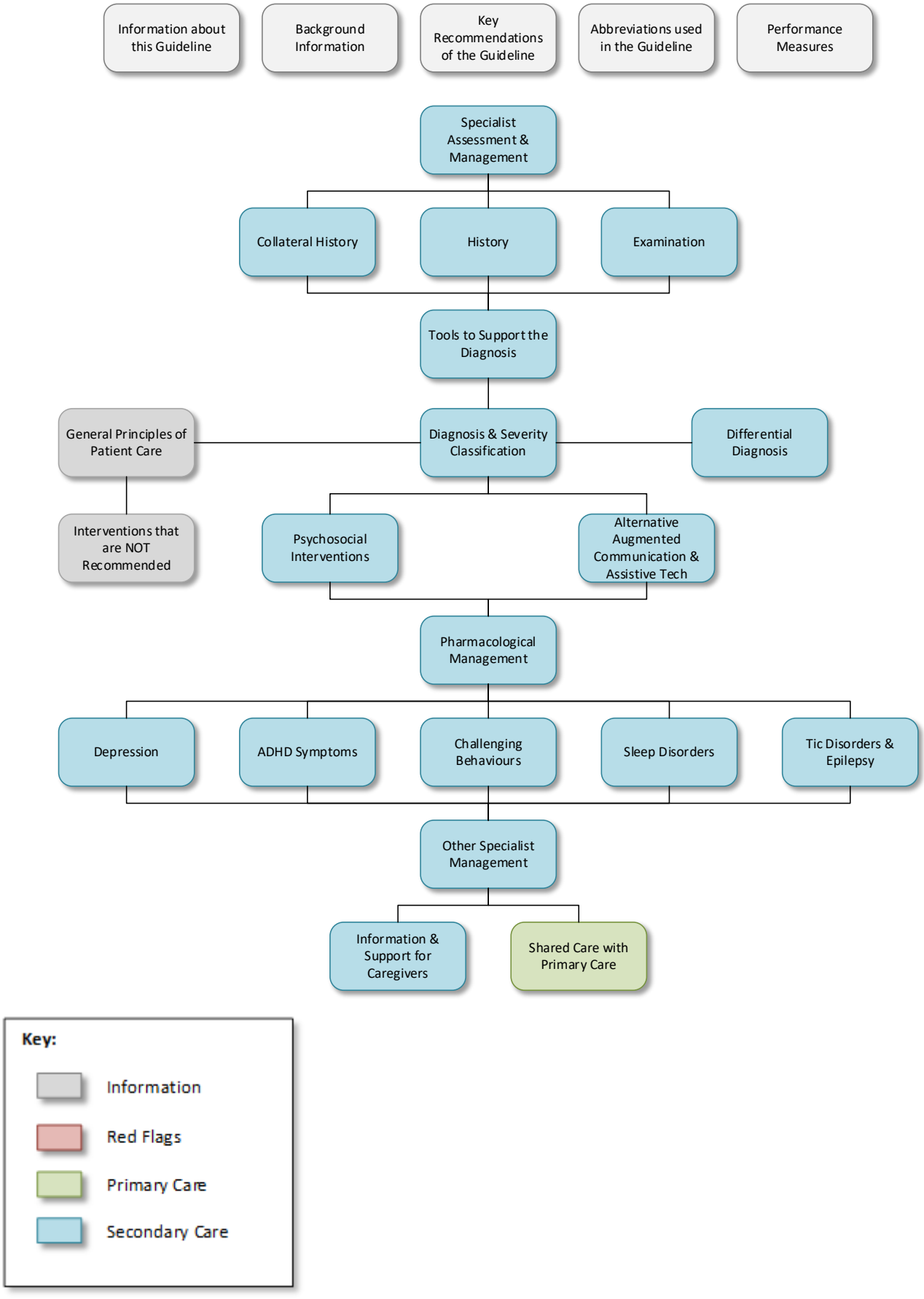
The guidance does not override individual professional responsibility to take decisions which are appropriate to the circumstances of the patient concerned. Such decisions should be made in consultation with the patient, their guardians, or carers and should consider the individual risks and benefits of any intervention that is contemplated in the patient's care.

2 Autism Spectrum Disorder Diagnosis & Management Pathway

Click on a box below to see the relevant page of the Pathway.






Information about this Guideline
Background Information
Key Recommendations of the Guideline
Abbreviations used in the Guideline
Performance Measures
Specialist Assessment & Management
Collateral History
History
Examination
Tools to Support the Diagnosis
General Principles of Patient Care
Diagnosis & Severity Classification
Differential Diagnosis
Interventions that are NOT Recommended
Psychosocial Interventions
Alternative Augmented Communication & Assistive Tech
Pharmacological Management
Depression
ADHD Symptoms
Challenging Behaviours
Sleep Disorders
Tic Disorders & Epilepsy
Other Specialist Management
Information & Support for Caregivers
Shared Care with Primary Care
Key:
Information
Red Flags
Primary Care
Secondary Care

View Pathway

3 Key Recommendations of the Guideline

The key recommendations of this guideline are as follows:

Clinical Presentation (*Section 5*):

- The presentation of ASD varies widely and is often accompanied by mental and physical health problems and corresponding manifestations[1].
- Different environmental contexts may change the manifestation of symptoms [2].
- Nearly 80-90% of parents of children with ASD, noticed a problem by 24 months of age[3].
- 30-50% of parents noticed problems before 12 months of age[3].
- See *Section 5.2* for summary for common symptoms and signs by age group.

Screening for ASD (*Section 6*):

- In addition to general developmental screening, all children should be **screened specifically for ASD** at [3,4] [**L1, RGA**]:
    - 18 months (Red flags).
    - 30 months (M-chat) [5].
    - Additional screening might be needed if:
        - A child is at high risk for ASD.
        - Behavioural symptoms associated with ASD are identified.
        - Parental concern about ASD [**R-GDG**].
- Do not rule out autism because of achievement of normal language milestones, good eye contact, smiling and showing affection to family members or reported "pretend" play[6] [**L1, RGC**].
- The following screening tools for ASD are recommended for children and young people:
    - *Red flags for Autism* tool [5].
    - *Modified-Checklist for Autism in Toddlers* (M-CHAT) [2,4,7].
    - *Modified Checklist for Autism in Toddlers, Revised with Follow-Up* (M-CHAT-R/F) [4,8].
    - *Social Communication Questionnaire* (SCQ) [2,7] for school age children.
    - *Childhood Autism Spectrum Test* (CAST) [2,7].
    - *Autism-Spectrum Quotient – 10 items* (AQ-10) [9].
- If any problems are detected, a comprehensive diagnostic evaluation and investigation are needed [3] [**L1, RGA**].

Referral for Specialist Assessment (*Section 7*):

- Referral for specialist diagnostic assessment should be made if the following criteria are met [**R-GDG**]:
    - Concerns about possible ASD on the basis of reported or observed signs and symptoms.
    - Positive result on autism screening tool.
    - Parental concern.
    - Regression in language or social skills in a child less than 3 years of age [6] [**L1, RGA**].
    - Children older than 3 years with regression in language, and individuals of any age with regression in motor skills, should be referred first to a paediatrician or paediatric neurologist [6] [**L1, RGA**].

Specialist Assessment and Diagnosis (*Section 8*):

- The diagnosis and management of ASD should be performed in a specialist multidisciplinary team setting [9,10] [**L1, RGA**] led by a developmental paediatrician or psychiatrist.
- Multiple sources of information should be used to collect the history, including from the parent/caregiver, school/work, or directly from the patient[1,11] [**L1, RGA**].
- However, signs and symptoms are not always recognised by parents and/or caregivers [6].

- If ASD is suspected, evaluation of symptoms and signs in different environments (home, school, community, in addition to the clinic) is highly preferred [2,6] [**L1, RGA**].

NB:

- When performing developmental and or psychometric evaluation, assessment of functioning should be performed across all developmental domains [**R-GDG**].

- The following tools can be used to support the process of diagnosing ASD:
  - *The Autism Diagnostic Interview – Revised* (ADI-R) [2,7].
  - *The Autism Diagnostic Observation Schedule – Generic* (ADOS-G) [2].
  - *Diagnostic Interview for Social and Communication Disorders* (DISCO) [2,7].
  - *The Adult Asperger Assessment* (AAA) [9].
  - *Vineland Adaptive Functioning Behaviour Scale* (Vineland-3) [12].
- Diagnosis should not be based solely on any one autism-specific assessment tool [6] [**L1, RGA**].
- If ASD diagnosis is uncertain, consider keeping the patient under review and collect new information when possible [6] [**L1, RGA**].
- Do not routinely perform biological tests, genetic tests and/or neuroimaging as part of the ASD diagnostic assessment [6,9] [**L1, RGA**] (see *Section 8.4*).

Diagnosis (*Section 9*):

- Information from all sources should be evaluated to diagnose autism [6] [**L1, RGA**].
- Use the DSM-V diagnostic criteria provided in *Table 9.1*[1] [**L1, RGA**] to make the diagnosis.
- Classify severity of ASD on the basis of the level of support needed for daily function[1] (see *Table 9.2*).
- It may be difficult to recognise functional problems or mental health problems in people with communication difficulties [6].
- Core symptoms of ASD may manifest differently in females than in males[2] and ASD may consequently be under-diagnosed in girls [2,6].
- Adults with ASD may develop adaptive mechanisms (e.g. mimicking gestures and conversational styles of others) to deal with social situations [2].
- If any of the following apply after assessment, consider obtaining a second opinion [6]:
  - Continued uncertainty about the diagnosis.
  - Disagreement about the diagnosis within the multi-disciplinary team (MDT).
  - Disagreement with caregiver and/or the patient about the diagnosis.
  - Lack of local access to particular skills and competencies needed to reach a diagnosis in a patient with a complex co-existing health disorder (such as a severe sensory or motor impairment or mental health problem).
  - Unexpected response to any therapeutic interventions provided to the patient.
- Developmental or behavioural concerns about a child or young person should be discussed with parents, caregiver, and with the child or young person themselves.
- The patient's age and ability to understand should be taken into account [**L1, RGA**] [6].
- Healthcare professionals should inquire if and how adults with ASD want their families, partners, or caregivers to be involved in their care [9] [**L1, RGA**].

Management of ASD (*Section 10*):

- The main goals of treatment are[7].:
  - To improve social communicative function.
  - Reduce the impact of repetitive and maladaptive behaviours.
  - Promote independent functioning and quality of life.
- All people with ASD should have a comprehensive assessment which should inform intervention and support individualised goal-oriented care [**R-GDG**].

- Early intervention for children with ASD is imperative to minimise the core deficits and maximise functional ability into adulthood[13].
- Care should be provided by a multidisciplinary team (MDT) of professionals, using an interdisciplinary approach[14], which has been individualised to the needs of the patient [**R-GDG**].
- People with ASD typically require multi-agency educational, social care and healthcare support over the duration of their lifespan [**R-GDG**].
- A proportion of adults can live independent lives, either with or without additional support from the community[7].
- Transitions between agencies and services should be coordinated and well planned. Among transition-age adolescents and young adults, consideration should be given to either vocational support or support during continuing education[7] [**L1, RGA**].
- Children with ASD have a right to education and wherever possible, should be educated in mainstream schools with individualised support[15].
- Where education cannot be provided in a mainstream setting, specialised educational schools should be provided[16].
- Wherever possible, people with ASD should be managed in a community setting in a shared care arrangement with their primary care physician [**R-GDG**].

Non-Pharmacological Management (*Section 10.2*):

- A Specific social communication intervention or other specialised interventions that target core features of ASD should be offered to all children and young people with ASD[6]. [**R-GDG**].
- See *Sections 10.2.1* and *10.2.2* for a list of interventions that can be offered to children, adolescents and adults.

Interventions that are Not Recommended (*Section 10.2.4*):

- Clinicians must clearly advocate against any intervention or alternative treatment that may be harmful for the patient or is not evidence-based[7] [**L1, RGA**].
- Exclusion diets (e.g., casein-free diet, gluten-free diet) are not recommended as a primary treatment for individuals with ASD due to lack of scientific evidence of benefit[2,7,17] [**L1, RGB**].
    - If exclusion diets are followed, children should be supported in maintaining good nutrition and a healthy weight[3,7] [**L1, RGA**].
- The following therapies are not recommended in treatment of ASD:
    - Chelation therapy[2] [**RGC**].
    - Hyperbaric oxygen therapy[2] [**RGC**].
    - Secretin treatment[2,7] [**RGB**].
    - Vitamin and mineral supplementation[18,19] [**RGB**].
    - Homeopathy[20,21] [**RGB**].
    - Empirical antibiotic and antifungal therapies[17] [**L1, RGC**].

Pharmacological Management (Section 10.3):

The pharmacological management is aimed at treating symptoms of the co-morbidities as currently there is no medical cure for Autism.

- Pharmacological management should only be undertaken by a developmental paediatrician or psychiatrist working as part of an MDT [**R-GDG**].
- No medication is available to treat core symptoms of ASD[2,3,7]..
- Medications may influence certain features of a patient's behaviour and comorbid conditions [2,3,7]:
- Depression:
    - Treatment with SSRIs should be used selectively in adolescents with depression or anxiety that cannot be managed non-pharmacologically [2,7] [**L1, RGA**].
        - SSRIs in ASD should only be prescribed by a psychiatrist [**R-GDG**].

- ADHD:
    - Medication to manage ADHD symptoms in individuals with ASD, include:
        - *Methylphenidate* [2,7] [**L1, RGA**].
        - *Atomoxetine* [2,7] [**L2, RGA**].
        - *Clonidine*, *guanfacine*, and *lofexidine* [2,7] [**L2, RGB**].

- Challenging Behaviours:
    - Psychotropic medications should not be used as a primary management strategy for challenging behaviours[7] [**L1, RGC**].
    - Such treatment should only be started if[7]:
        - Other interventions alone are insufficient.
        - If the risk to the person or others is very severe (e.g., due to violence, aggression, or self-injury).
    - Before starting antipsychotics, discuss the benefits and harms with the patient, family members, and carers [7] [**L1, RGA**].
    - Stop treatment if the patient is not benefiting from taking them [**R-GDG**].
    - Antipsychotics should only be prescribed and regularly monitored by a psychiatrist [**R-GDG**].
- Sleep Disorders:
    - *Melatonin* is recommended to manage sleep disturbances in children with ASD who have insufficient benefit from sleep hygiene routines and behavioural intervention[2,7,22] [**L1, RGA**].
    - *Melatonin* is recommended for adults with ASD, based on extrapolation from findings in children [2,23] [**L1, RGA**].

Information and Support for Caregivers (*Section 10.5*):

- Caregivers are vital to ensuring optimal health outcomes and access to services for individuals with ASD [**R-GDG**].
- Interventions that aim to improve the parent-child relationship and encourage expressions of praise should be offered to families with individuals diagnosed with ASD [24] [**RGA**].
- Parents, caregivers, and individuals with autism should be provided with the following information [**R-GDG**]:
    - Information about ASD.
    - Contact details for local and national support organisations.
    - Information to help prepare for the future (e.g. transition to adult services).
- If an adult patient with ASD *wants* their family to be involved in the care, this involvement should be encouraged[9].
- Parents should be informed that they have an increased chance of having another child with ASD, compared with the general population[6,7,23].

View Pathway

4 Background Information

4.1 Definition

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by pervasive difficulties since early childhood across reciprocal social communication and restricted, repetitive interests and behaviours [1].

The onset of the disorder occurs during the developmental period, typically in early childhood, but symptoms may not fully manifest until social demands exceed limited capacities. Deficits are sufficiently severe to cause impairment in personal, family, social, educational, occupational or other important areas of functioning. These disturbances are not better explained by intellectual disability (ID), global developmental delay, or other mental health disorders [1].

4.2 Prevalence

In Qatar, the prevalence rate is 6 to 7 children per 1000 in the low probability group (children in mainstream education)[25]. The prevalence reported by the US CDC is estimated at 1 in 59[26].

In ~10%, ASD occurs in association with chromosomal abnormalities and recognized genetic syndromes, such as fragile X syndrome, tuberous sclerosis, and Down syndrome [7,27]. In 10-30% copy number variation has been observed [7].

4.3 Prognosis

ASD is a lifelong condition with a highly variable clinical course[7]. The overall prognosis depends on[7,28]:

- Age of diagnosis.
- Severity of ASD.
- Early intervention.
- Presence of ID.
- Comorbidities.

Children with optimal outcomes had earlier referrals and more intensive interventions with earlier intervention and fewer pharmacologic interventions [13,28].

Interventions that aim to improve the parent-child relationship may improve the long-term outcomes for children with ASD [24].

4.4 Risk Factors for Development of Autism

Risk factors for autism are [2,6,23]:

- Genetic, including:
    - Fragile X Syndrome.
    - Down's syndrome.
    - Tuberous sclerosis complex (TSC).
    - Single gene loss of function mutations.

- Environmental factors h, including:
    - Prenatal, perinatal, and neonatal complications.
    - Increased paternal age.
    - Maternal use of sodium valproate in pregnancy.

4.5 Classification

In this guideline, we refer to the DSM-V classification system published in 2013 [1]. ICD-10 was published in 1993 and ICD-11 is not due for publication until 2020. At present, it therefore remains uncertain how the two systems will correspond.

4.5.1 DSM-V

All previous ASD phenotype diagnoses (i.e., autistic disorder, Asperger's syndrome, atypical autism, and pervasive developmental disorder not otherwise specified (PDD-NOS)) correspond now to a **single diagnosis** of **ASD** [1]. DSM-V acknowledges that ID and attention-deficit hyperactivity disorder (ADHD) can both co-occur with autism[1,29].

Note [1]:

- Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or PDD-NOS should be given the diagnosis of ASD.
- Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for ASD, should be evaluated for social (pragmatic) communication disorder (SCD).

4.6 Associated Conditions

The conditions associated with ASD, include:

- Mental health conditions.
- Neurodevelopmental disorders.
- Sensory processing difficulties.
- Epilepsy and seizures.
- Challenging behaviours.
- Sleep disorders.
- Feeding and eating problems

Each of these is discussed in the sections below.

4.6.1 Mental Health Conditions

The following mental health conditions may accompany ASD [2,6,7,23,30,31]:

- ADHD.
- Mood disorders, including:
    - Depression
    - Bipolar disorder.
- Anxiety disorders.
- Oppositional defiant disorder.

- Tics or Tourette syndrome.
- Obsessive-compulsive disorder (OCD).
- Schizophrenia.

4.6.2 Neurodevelopmental Disorders

Neurodevelopmental problems and disorders are often present in individuals with ASD [6]:

- Global developmental delay.
- ID.
- Motor coordination problems or developmental coordination disorder.
- Learning difficulties.
- Speech and language impairment.

4.6.3 Sensory Processing Difficulties

People with ASD may have sensory processing difficulties including [32]:

- Tactile defensiveness.
- Sensory seeking.
- Sensory avoidance.
- Modulation.
- Regulation.

4.6.4 Epilepsy and Seizures

The prevalence of epilepsy is higher in individuals with ASD than in the general population and is associated with higher risk of mortality[23,30,33,34]. Children with ASD are more likely to develop seizures after the age of 10 years and may first present in adolescence or adulthood [35]. The risk of epilepsy and seizure development increases with age.

The following risk factors are associated with epilepsy and seizure development [23,35]:

- Female gender.
- Global developmental delay.
- ID.
- Genetic disorders.

No particular seizure types are associated with ASD [23].

4.6.5 Challenging Behaviours

Challenging behaviours are usually defined as behaviours which are likely to cause significant harm or disruption or which may result in someone being excluded from everyday activities [36].

They are an important factor in determining quality of life for individuals with ASD [17]. They include [17,24,36,37]:

- Withdrawn behaviours.
- Disruptive behaviours.
- Violent or unsafe behaviours.
    - Self-injurious behaviours
- Inappropriate social behaviours.

View Pathway

4.6.6 Sleep Disorders

Sleep problems tend to worsen behaviour of individuals with ASD, interfere with learning, and decrease overall quality of life [31]. Typical sleep problems in individuals with ASD, may include difficulties in sleep onset and night waking [2,22,38,39].

4.6.7 Feeding and Eating Problems

Feeding and eating problems are more common in individuals with ASD than in the general population[23,30,31]. Sensory sensitivities may lead to an increased food selectivity (e.g., eating a highly limited range of food or just one food). This may result in [23,30]:

- Poor nutrition.
- Vitamin deficiency.
- Altered gut motility.
- Underweight, overweight or obesity.
- Constipation.
- Other GI problems.
- Pica.

Children with ASD are more likely to be placed on restricted or elimination diets by their caregivers [23,30].

5 Clinical Presentation

Individuals with ASD experience problems with social, emotional, and communication skills [1–3,6,9,24]. They might repeat certain behaviours and may have a preference towards sameness and routine. People with ASD often have atypical ways of playing, learning, paying attention, or reacting to the environment[3,6,7].

Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning[1]. The presentation of ASD varies widely and is often accompanied by mental and physical health problems and corresponding manifestations[1] (see *Section 4.6*). Different environmental contexts may change the manifestation of symptoms [2].

5.1 Age Variation at Presentation

ASD begins in early childhood[3,40]:

- Some children show symptoms of ASD within the first few months of life[3,40].
- Some children develop normally in early childhood and then stop gaining new, or lose previously acquired, skills[3].
- In some individuals, autism symptoms may not be recognised until later childhood, adolescence or adulthood.

Nearly 80-90% of parents of children with ASD, noticed a problem by 24 months of age; 30-50% of parents noticed problems before 12 months of age [3]. However, signs and symptoms are not always recognised by parents and/or carers [6].

In high-functioning children and adults with ASD, symptoms may not fully manifest until social demands exceed limited capacities, e.g. during transition from clearly organized school life to more freedom in college [1]. Adolescents and adults with ASD may develop adaptive mechanisms to manage social situations (e.g. mimicking gestures and conversational style of others). It can mask the presentation and delay the diagnosis [2].

5.2 Symptoms and Signs of ASD

The symptoms and signs that may be present in different age groups, are described in the following subsections:

- Preschool age children (<5 years).
- Primary school age children (5-11 years).
- Secondary school age children (11-18 years).
- Adults (>18 years).

NB: Symptoms and signs listed below are not necessarily present in all individuals with ASD and the list is also not exhaustive [2,3,9]. Individuals *without* ASD might also have some of these symptoms and signs without impairment of function or impact on daily life [3].

5.2.1 Preschool Age Children (<5 years old)

Symptoms that may be present in children of preschool age (or equivalent mental age), are shown in *Table 5.2.1* below [3,6,7]:

Aspect	Symptoms and signs
Verbal communication	• Expressive language delay or loss. • Unusual non-speech like vocalisations. • Odd or flat intonation. • Frequent repetition of words and phrases (echolalia). • Excessive self-talk [**R-GDG**]. • Reversed pronouns beyond 3 years (e.g., 'you' or 'she/he' instead of 'I'). • Reduced or infrequent use of verbal communication (e.g. use of single words although able to speak in sentences). • Inappropriate use of sophisticated language [**R-GDG**].

Non-verbal communication	• Reduced or poorly-integrated non-verbal communication in social interaction:
	  ○ Reduced pointing.
	  ○ Gestures (e.g. waving goodbye).
	  ○ Facial expressions.
	  ○ Body orientation.
	• Reduced or absent social use of eye contact (despite normal vision).
	• Reduced or absent shared attention, shown by lack of:
	  ○ Gaze switching.
	  ○ Following a point (looking where the other person points to – may look at hand)
	  ○ Showing or sharing objects of interest with shared enjoyment.

Responding to others	• Absent or delayed response to name by 12 months of age (despite normal hearing). • Reduced or absent responsive social smiling. • Reduced or absent responsiveness to other people's facial expressions and/or feelings. • Flat or inappropriate facial expressions. • Unusually negative response to requests of others. • Giving unrelated answers to questions. • Rejection of cuddles initiated by parent or caregiver, although may seek excessive cuddles themselves.
Interacting with others	• Reduced or absent awareness of personal space and/or unusually intolerant of people entering their personal space. • Reduced or absent social interest in others, including children of his/her own age – may reject others; if interested in others, may approach others inappropriately, seeming to be aggressive or disruptive. • Reduced or absent imitation of others' actions. • Reduced or absent initiation of social play with others, plays alone. • Reduced or absent physical contact with others. • Reduced or absent enjoyment of situations that most children of their age like (e.g., birthday parties). • Reduced or absent sharing of enjoyment. • Interaction to achieve a desired goal only. • Getting upset by minor changes. • Unusual mood or emotional reactions.
Ideas and Imagination	• Reduced or absent imagination demonstrated in play. • Difficulties in playing “pretend” games or roleplay. • Lack of fear or more fear than expected.

Aspect	Symptoms and signs

Unusual or restricted interests and/or rigid and repetitive behaviours	• Repetitive 'stereotypical' movements such as:
	  ○ Hand flapping.
	  ○ Body rocking.
	  ○ Spinning self in circles.
	  ○ Finger flicking.
	  ○ Bouncing up and down.
	  ○ Running repetitively back and forth.
	• Repetitive or stereotyped play, (e.g. opening and closing doors).
	• Lining up toys or other objects.
	• Increased interest in parts of objects (e.g. wheels).
	• Over-focused or unusual interests.
	• Having obsessive interests.
	• Excessive non-directed, purposeless activity.
	• Excessive insistence on following own agenda.
	• Extremes of emotional reactivity to change or new situations.
	• Insistence on things being 'the same' and preference for routine.
	• Over or under reaction to sensory stimuli (e.g. textures, sounds, smells, tastes, movement).
	• Excessive reaction to taste, smell, texture, or appearance of food or extreme food fads.

Table 5.2.1: Symptoms that may be present in children of preschool age (or equivalent mental age).

5.2.2 Primary School Age Children (5-11 years old)

Symptoms that may be present in children of primary school age (or equivalent mental age), are shown in *Table 5.2.2* below [3,6,7]:

Aspect	Symptoms and signs
Verbal communication	• Limited use of language. • Odd or flat intonation. • Repetitive speech. • Frequent use of stereotyped (learnt) phrases. • Content dominated by excessive information on topics of own interest. • Talking 'at' others rather than sharing a two-way conversation. • Monologue speech. • Responses to others can seem rude or inappropriate.

Non-verbal communication	• Reduced and poorly integrated in social communication:
	  ○ Gestures.
	  ○ Facial expressions.
	  ○ Body orientation.
	• Reduced or absent social use of eye contact (despite normal vision).
	• Reduced or absent shared attention, shown by lack of:
	  ○ Gaze-switching.
	  ○ Following a point (looking where the other person points to – may look at hand)
	  ○ Showing or sharing objects of interest with shared enjoyment.

Aspect	Symptoms and signs
Responding to others	• Reduced or absent response to other people's facial expression or feelings. • Reduced or delayed response to name (despite normal hearing). • Subtle difficulties in understanding other's intentions. • Taking things literally. • Misunderstanding sarcasm, metaphor or jokes. • Unusually negative response to requests of others.
Interacting with others	• Reduced or absent awareness of personal space and/or unusually intolerant of people entering their personal space. • Reduced or absent social interest in people, including children of his/her own age – may reject others; if interested in others, may approach others inappropriately, seeming to be aggressive or over-friendly. • Reduced or absent greeting and farewell behaviours. • Reduced or absent awareness of socially-expected behaviour. • Reduced or absent ability to share in the social play or ideas of others, plays alone. • Problems losing at games, turn-taking, and understanding 'changing the rules'. • Unable to adapt style of communication to social situations (e.g. may be overly formal or inappropriately familiar). • Reduced or absent enjoyment of situations that most children their age like.
Ideas and imagination	• Reduced or absent flexible imaginative play or creativity, although scenes seen on visual media (e.g., television) may be re-enacted. • Makes comments without awareness of social niceties or hierarchies.

Unusual or restricted interests and/or rigid and repetitive behaviours	• Repetitive 'stereotypical' movements such as:
	  ○ Hand flapping.
	  ○ Body rocking.
	  ○ Spinning self in circles.
	  ○ Finger flicking.
	  ○ Bouncing up and down.
	  ○ Running repetitively back and forth.
	• Play repetitive and oriented towards objects rather than people.
	• Over-focused or unusual interests.
	• Rigid expectation that other children should adhere to rules of play.
	• Lining up toys or other objects.
	• Increased interest in parts of objects (e.g., wheels).
	• Excessive insistence on following own agenda.
	• Extremes of emotional reactivity that are excessive for the circumstances.
	• Strong preferences for familiar routines and things being 'just right'.
	• Dislike of change, which often leads to anxiety or other forms of distress (including aggression).
	• Over or under reaction to sensory stimuli (e.g., textures, sounds, smells or movements).
	• Excessive reaction to taste, smell, texture, or appearance of food or extreme food fads.

Other signs	• Unusual profile of skills or deficits (e.g., social or motor coordination skills poorly developed, while reading or vocabulary skills are advanced). • Social and emotional development more immature than other areas of development.

Table 5.2.2: Symptoms and signs that may be present in children of primary school age (or equivalent mental age).

View Pathway

5.2.3 Secondary School Age Children (11-18 years old)

Symptoms and signs that may be present in children of secondary school age (or equivalent mental age), are shown in *Table 5.2.3* below [6]:

Aspect	Symptoms and signs
Verbal communication	• Limited use of language. • Odd or flat intonation. • Repetitive speech. • Frequent use of stereotyped (learnt) phrases. • Content dominated by excessive information on topics of own interest. • Talking 'at' others rather than sharing a two-way conversation. • Monologue speech. • Responses to others can seem rude or inappropriate.

Non-verbal communication	• Reduced and poorly integrated in social communication:
	  ○ Gestures.
	  ○ Facial expressions.
	  ○ Body orientation.
	• Reduced or absent social use of eye contact (despite normal vision).

Interacting with others	• Reduced or absent awareness of personal space and/or unusually intolerant of people entering their personal space. • Long-standing difficulties in reciprocal social communication and interaction (e.g. few close friends or reciprocal relationships). • Reduced or absent understanding of friendship. • May have a desire to make friends but have difficulty initiating and maintaining friendships (although may find it easier with adults or younger children). • Social isolation and apparent preference for aloneness. • Reduced or absent greeting and farewell behaviours. • Lack of awareness and understanding of socially-expected behaviour. • Problems losing at games, turn-taking, and understanding 'changing the rules'. • May appear unaware or uninterested in what other young people his or her age are interested in. • Unable to adapt style of communication to social situations (e.g. may be overly formal or inappropriately familiar). • Subtle difficulties in understanding other's intentions. • Taking things literally. • Misunderstanding jokes, sarcasm or metaphors. • Makes comments without awareness of social niceties or hierarchies. • Unusually negative response to requests of others.
Ideas and imagination	• History of a lack of flexible social imaginative play and creativity, although scenes seen on visual media (e.g., television) may be re-enacted.

Unusual or restricted interests and/or rigid and repetitive behaviours	• Repetitive 'stereotypical' movements such as:
	  ○ Hand flapping.
	  ○ Body rocking.
	  ○ Spinning self in circles.
	  ○ Finger flicking.
	  ○ Bouncing up and down.
	  ○ Running repetitively back and forth.
	• Preference for highly specific interests or hobbies.
	• A strong adherence to rules or fairness that leads to arguments.

Aspect	Symptoms and signs
	• Highly repetitive behaviours or rituals that negatively affect the young person's daily activities. • Excessive emotional distress at what may seem trivial to others (e.g. change in routine). • Dislike of change, which often leads to anxiety or other forms of distress including aggression. • Over or under reaction to sensory stimuli (e.g., textures, sounds, smells or movements). • Excessive reaction to taste, smell, texture, or appearance of food and/or extreme food fads.
Other signs	• Unusual profile of skills or deficits (e.g. impaired social interaction with advanced academic achievement). • Social and emotional development more atypical for their age group, than other areas of development. • Mood swings and unexplained anxiety.

Table 5.2.3: Symptoms and signs that may be present in children of secondary school age (or equivalent mental age).

5.2.4 Adults

Symptoms that have been present in childhood may continue into adulthood, including but not limited to those listed in *Table 5.2.4* below. [2,6,9,30]:

Aspect	Symptoms and signs
Verbal communication	• Limited use of language to fulfil needs only. • Odd or flat intonation. • Repetitive speech. • Frequent use of stereotyped (learnt) phrases. • Content dominated by excessive information on topics of own interest. • Talking 'at' others rather than sharing a two-way conversation. • Monologue speech. • Responses to others can seem rude or inappropriate.
Non-verbal communication	• Reduced and poorly integrated in social communication: • Gestures. • Facial expressions. • Body orientation. • Reduced/absent or excessive social use of eye contact (despite normal vision).
Interacting with others	• Reduced or absent physical contact with others. • Reduced or absent awareness of personal space and/or unusually intolerant of people entering their personal space. • Long-standing difficulties in reciprocal social communication and interaction (e.g. few close friends or reciprocal relationships). • Reduced or absent understanding of friendship. • May have a desire to make friends but have difficulty initiating and maintaining relationships (although may find it easier with older adults or children). • Social isolation and apparent preference for aloneness. • Reduced or absent greeting and farewell behaviours.

Aspect	Symptoms and signs
	• Lack of awareness and understanding of socially-expected behaviour. • May appear unaware or uninterested in what other adults his or her age are interested in. • Unable to adapt style of communication to social situations (e.g. may be overly formal or inappropriately familiar). • Subtle difficulties in understanding other's intentions. • Taking things literally. • Misunderstanding jokes, sarcasm or metaphors. • Makes comments without awareness of social niceties or hierarchies. • Unusually negative response to requests of others. • Interaction to fulfil needs only. • Interaction that is naive or one-sided. • Lack of responsiveness to others. • Limited social demonstration of empathy. • A strong adherence to rules or fairness that leads to argument.

Unusual or restricted interest and/or rigid and repetitive behaviours	• Repetitive stereotypical movements such as:
	  ○ Hand flapping.
	  ○ Body rocking.
	  ○ Finger flicking.
	  ○ Posturing (adopting unusual body postures).
	  ○ Pacing.
	• Resistance to change or restricted interests.
	• Over or under reaction to sensory stimuli (e.g., textures, sounds, smells, tastes and movements).

Other signs	• Frequent mood changes and anxiety. • Phobias.

Table 5.2.4: Symptoms and signs that may be present in adults.

View Pathway

6 Screening for ASD

General developmental screening is a brief test to see whether children learn basic skills when they should or whether developmental delays are present [3]:

- Ask the parent about behaviour and development of the child [**L1, RGA**].
- Play with the child during an examination to see how the child learns, speaks, behaves, and moves [**L1, RGA**].

General developmental screening should be performed regularly at [3,7,41] [**L1, RGA**]:

- 9 months.
- 18 months.
- 24 or 30 months.
- Additional screening might be needed if a child is at high risk for developmental problems.

In addition to the developmental screening, all children should be **screened specifically for ASD** at [3,4] [**L1, RGA**]:

- 18 months.
- 30 months [5].
- Additional screening might be needed if:
    - A child is at high risk for ASD.
    - Behavioural symptoms associated with ASD are identified.
    - Parental concern about ASD [**R-GDG**].

Do not rule out autism because of [6] [**L1, RGC**]:

- Normal language milestones.
- Good eye contact.
- Smiling and showing affection to family members.
- Reported "pretend" play.

The following screening tools for ASD are recommended for children and young people:

- ***Red flags for Autism*** tool [5].
- ***Modified-Checklist for Autism in Toddlers*** (M-CHAT) [2,4,7]:
    - Age: 16-30 months.
    - Answered by caregiver.
    - Sensitivity and specificity depend on age.
- ***Modified Checklist for Autism in Toddlers, Revised with Follow-Up*** (M-CHAT-R/F) [4,8]:
    - Age: 16-30 months.
    - Answered by caregiver.
    - More specific than M-CHAT.
- ***Social Communication Questionnaire*** (SCQ) [2,7]:
    - Age: >4 years.
    - Answered by caregiver.
    - Sensitivity and specificity depend on age.
- ***Childhood Autism Spectrum Test*** (CAST) [2,7]:
    - Age: 4-11 years & 10-16 years.
    - Answered by caregiver.
    - For children suspected for higher-functioning ASD.
- ***Autism-Spectrum Quotient – 10 items*** (AQ-10) [9]:
    - Use child or adult version depending on age of the patient.
    - If a person has reading difficulties, read out the test.

If any problems are detected, a comprehensive diagnostic evaluation and investigation are needed [3] [**L1, RGA**].

View Pathway

7 Referral for Specialist Assessment

Referral for specialist diagnostic assessment should be made if the following criteria are met [**R-GDG**]:

- Concerns about possible ASD on the basis of reported or observed signs and symptoms.
- Positive result on autism screening tool.
- Parental concern.
- Regression in language or social skills in a child less than 3 years of age [6] [**L1, RGA**].
- Children older than 3 years with regression in language, and individuals of any age with regression in motor skills, should be referred first to a paediatrician or paediatric neurologist [6] [**L1, RGA**].

8 Specialist Assessment & Diagnosis

8.1 Multidisciplinary Team

The diagnosis and management of ASD should be performed in a specialist **multidisciplinary team** comprising [9,10] [**L1, RGA**]:

- ASD specialised Physician (developmental paediatrician or psychiatrist).
- Clinical psychologists.
- Occupational therapists.
- Speech and language therapists.
- Nurses.

8.2 History

History taking should be directed to establishing the probability of a diagnosis of ASD. Multiple sources of information should be used to collect the history, including[1,11] [**L1, RGA**]:

- Parent/caregiver history.
- Collateral history from school/work.
- Self-report (if possible).

Important points in the history to elicit from the patient and caregiver include [3,4,6,9,23] [**R-GDG**]

- Symptoms of social, emotional and communication skills (see *Section 5.2*), including:
    - Current behaviour, socialization, odd or stereotypical behaviours and play interests.
    - Hyper- and/or hypo-sensory sensitivities.
    - Current communication abilities.
- Developmental history, including.
    - Prenatal, perinatal and neonatal history
    - Language, social and motor milestones.
    - Regression of previously acquired skills.
- Functioning at home, in education or in employment.
- Presence of risk factors (see *Section 4.4*).
- Past medical history including:
    - Medical issues especially seizures, ear infections, surgeries and hospitalisation.
- Psychiatric history.
- Family history, particularly of:
    - ASD.
    - Developmental disorders including language disorders, intellectual or learning disabilities and ADHD.

- Mental health disorders including depression, obsessive-compulsive disorder, schizophrenia and other mental illnesses.

Note: When interviewing others, be aware that signs and symptoms are not always recognised by parents and/or caregivers [6].

8.3 Examination

If ASD is suspected, the following should be undertaken [2,6,11] [**L1, RGA**]:

- Clinical observations.
- Physical examination[6,17] [**L1, GRA**]:
  - Height, weight and head circumference.
  - Any marked changes in growth rate.
  - Skin stigmata.
  - Signs of injury (e.g. self-harm, abuse or neglect).
  - Congenital anomalies and dysmorphic features.
  - General systemic examination, including neurological examination.
- Cognitive testing:
  - Should be performed in individuals with suspected cognitive difficulties.
  - Common tests in use (depending on child's age and abilities) that may be performed by a variety of specialists in an interdisciplinary team setting[3] [**R-GDG**] include:
    - Bayley Scales of Infant Development
    - Mullen Scales of Early Learning
    - Wechsler Preschool and Primary Test of Intelligence
    - Wechsler Intelligence Scale for Children
    - Stanford-Binet Intelligence Scales
- Assessment of:
  - Associated conditions (see *Section 4.6*).
  - Challenging behaviour.
- Language and communication assessment. Common tests[3] in use that may be performed depending on the child's age and abilities [**R-GDG**] include:
    - Preschool Language Scale
    - MacArthur Communicative Development Inventory
- Assessment of motor functioning[3] [**R-GDG**]:
    - Peabody Developmental Motor Scales
    - Gross Motor Scale
- Adaptive functioning:
    - Vineland Adaptive Behaviour Scales (See *Section 8.3.1*)
- Sensory assessment.
- Comprehensive educational assessment, as indicated.

NB:

- When performing developmental and or psychometric evaluation, assessment of functioning should be performed across all developmental domains [**R-GDG**].

If ASD is suspected, evaluation of symptoms and signs in different environments (home, school, community, in addition to the clinic) is highly preferred [2,6] [**L1, RGA**].

8.3.1 Tools to Support Diagnosis

The following tools can be used to support the process of diagnosing ASD:

- ***The Autism Diagnostic Interview – Revised*** (ADI-R) [2,7]:
  - Age: >2 years.
  - Answered by caregiver.
- ***The Autism Diagnostic Observation Schedule – Generic*** (ADOS-G) [2]:
  - Age: >12 months.
  - Clinical observation via interaction.
- ***Diagnostic Interview for Social and Communication Disorders*** (DISCO) [2,7]:
  - All ages.
  - Answered by caregiver.
  - Consider using if no developmental history is available.
- ***The Adult Asperger Assessment*** (AAA) [9]:
  - Includes the Autism-Spectrum Quotient.
  - Includes the Empathy Quotient.
- ***Vineland Adaptive Functioning Behaviour Scale*** (Vineland-3) [12]:
  - All ages.
  - Measurement of the conceptual, practical, and social skills.
  - Interview, parent/caregiver, and teacher forms are available.

Note:

- Diagnosis should not be based solely on any one autism-specific assessment tool [6] [**L1, RGA**].
- If ASD diagnosis is uncertain, consider keeping the patient under review and collect new information when possible [6] [**L1, RGA**].

8.4 Investigations

Do not routinely perform biological tests, genetic tests and/or neuroimaging as part of the ASD diagnostic assessment [6,9] [**L1, RGA**]. Consider further medical investigation in individual circumstances and based on:

- Physical examination.
- Clinical judgment.
- Patient's profile.

Genetic tests are recommended for both children and adults suspected for ASD if there are [6,9,41] [**L1, RGA**]:

- Specific dysmorphic features.
- Congenital anomalies.
- Evidence of ID.
- Family history of ASD or other mental health or development disorders.

Consider using array comparative genomic hybridization (aCGH) test to investigate the presence of copy number variants [7] [**L1, RGA**].

Consider selective metabolic testing in the presence of suggestive clinical and physical findings such as [41] [**L1, RGA**]:

- Lethargy.
- Cyclic vomiting.
- Early seizures.
- Dysmorphic or coarse features.
- ID.
- Occurrence or adequacy of newborn screening at birth is questionable.

View Pathway

The following tests may be considered for both children and adults [7,9] [**L1, RGA**]:

- Electroencephalography (EEG) for suspected epilepsy/seizure disorders.
- Hearing test.
- Vision test (if visual impairment is suspected).
- Magnetic resonance imaging (MRI):
    - Not recommended as routine test, but can be justified in case of specific clinical findings in the history or examination [7] [**L1, RGB**].
- Other medical tests depending on individual signs and symptoms.

The following tests are **not** recommended [41] [**L1, RGB**]:

- Magnetoencephalography (MEG).
- Hair analysis.
- Coeliac antibodies.
- Allergy testing, particularly food allergies for:
    - Gluten.
    - Casein.
    - Candida and other moulds.
- Immunologic or neurochemical abnormalities.
- Vitamin levels.
- Intestinal permeability studies.
- Stool analysis.
- Urinary peptides.
- Mitochondrial disorders (including lactate and pyruvate).
- Erythrocyte glutathione peroxidase studies.

View Pathway

9 Diagnosis

9.1 Diagnosing ASD

Information from all sources should be evaluated to diagnose autism [6] [**L1, RGA**]. Use DSM-V diagnostic criteria given in *Table 9.1* below [1] [**L1, RGA**]:

Criterion	Symptoms and signs
Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the symptoms and signs listed, either currently or by history	• Deficits in social-emotional reciprocity ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions. • Deficits in nonverbal communicative behaviours used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication. • Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behaviour to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.
Restricted, repetitive patterns of behaviour, interests, or activities, as manifested by at least two of the symptoms and signs listed, either currently or by history	• Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases). • Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behaviour (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day). • Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest). • Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).
Notes	

• ASD should be diagnosed if the above disturbances are not better explained by ID or global developmental delay [1] [**L1, RGA**].
• To make comorbid diagnoses of ASD and ID, social communication should be below that expected for the general developmental level [1] [**L1, RGA**].
• Alterations of motor systems are not specific diagnostic indicators 26 [**L2, RGC**].
 	
• ASD diagnosis should be specified[1] as one of the following: [**L1, RGA**]:
  ○ With or without accompanying intellectual impairment.
  ○ With or without accompanying language impairment.
  ○ Associated with a known medical or genetic condition or environmental factor.
  ○ Associated with another neurodevelopmental, mental, or behavioural disorder.
  ○ With catatonia.	

Table 9.1: DSM-V Diagnostic criteria[1].

9.2 Severity Classification

Severity levels of ASD based on the level of support needed for daily function[1] are shown in *Table 9.2* below.

Severity level	Social communication	Restricted, repetitive behaviours
Level 3 *"Requiring very substantial support"*	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. *For example,* a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.	Inflexibility of behaviour, extreme difficulty coping with change, or other restricted/repetitive behaviours markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.
Level 2 *"Requiring substantial support"*	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. *For example,* a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.	Inflexibility of behaviour, difficulty coping with change, or other restricted/ repetitive behaviours appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
Level 1 *"Requiring support"*	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. *For example,* a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.	Inflexibility of behaviour causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

Table 9.2: Severity Classification[1].

9.3 Diagnostic Challenges

Increased attention is required from the healthcare professional when diagnosing ASD in [2,6] [**L1, RGA**]:

- Children younger than 24 months.
- People without available information about their early life (e.g., adopted children).
- Older teenagers.
- People with ID.
- People with complex co-existing health disorders, such as:
    - Psychiatric disorders.
    - ADHD.
    - Conduct disorder.
    - Attachment disorder.
    - Sensory impairments (hearing or visual).
    - Motor disorders (such as cerebral palsy).

NB: It may be difficult to recognise functional problems or mental health problems in people with communication difficulties [6].

Core symptoms of ASD may manifest differently in females than in males [2] and ASD may consequently be under-diagnosed in girls [2,6]. The "female phenotype" should be considered when diagnosing ASD [2] [**L1, RGA**]:

- Females may have fewer stereotyped behaviours.
- Females may have more socially accepted interests.
- Females may demonstrate overt shyness or bossiness.
- Females may have more perfectionist tendencies
- Females may have restricted interests that involve people rather than objects (e.g. literature or pop bands).
- Females are more likely to develop coping strategies to manage social situations.
- Females may successfully mask the degree of their social isolation.

NB: Adults with ASD may develop adaptive mechanisms (e.g. mimicking gestures and conversational styles of others) to deal with social situations [2].

If any of the following apply after assessment, consider obtaining a second opinion [6]:

- Continued uncertainty about the diagnosis.
- Disagreement about the diagnosis within the multi-disciplinary team (MDT).
- Disagreement with caregiver and/or the patient about the diagnosis.
- Lack of local access to particular skills and competencies needed to reach a diagnosis in a patient with a complex co-existing health disorder (such as a severe sensory or motor impairment or mental health problem).
- Unexpected response to any therapeutic interventions provided to the patient.

9.4 Differential Diagnosis

If ASD diagnosis is uncertain, consider other psychiatric or medical disorders [6] [**L1, RGA**]:

- Mental and behavioural disorders:
    - Mood disorder.

  - Anxiety disorder.
  - Attachment disorders.
  - Oppositional defiant disorder.
  - Conduct disorder.
  - ADHD.
  - OCD.
  - SCD*.
  - Psychosis.
- Neurodevelopmental disorders:
  - Specific language delay or disorder.
  - ID or global developmental delay.
  - Developmental coordination disorder.
- Conditions with developmental regression:
  - Rett syndrome.
  - Epileptic encephalopathy.
- Other conditions:
  - Severe visual impairment.
  - Severe hearing impairment.
  - Maltreatment.
- Selective mutism.

SCD is a new diagnosis considered as a communication disorder with deficits in social verbal and non- verbal communication [1]. SCD should be diagnosed in people who have persistent problems with the social use of language, but do not have restricted interests or repetitive behaviours [1,2] **[L1, RGA].*

9.5 Communicating the Diagnosis

Developmental or behavioural concerns about a child or young person should be discussed with parents, caregiver, and with the child or young person themselves. The patient's age and ability to understand should be taken into account [**L1, RGA**] [6].

Possible causes (including autism) should be discussed sensitively, emphasising that there may be many explanations for the child's or young person's behaviour[6] [**L1, RGA**]. The basis of conclusions even if the diagnosis of autism was not reached should also be explained [6] [**L1, RGA**].

If developmental or behavioural conditions were not suspected by parents or the patient, raising the possibility may cause distress and[6]:

- It may take time for them to come to terms with the concern.
- They may not share the concern.

Information about autism, its common effects on the child's development and function, and a report of the autism diagnostic assessment should be shared with parents, caregiver, and, if appropriate, with the person with ASD[6] [**L1, RGA**].

Healthcare professionals should inquire if and how adults with ASD want their families, partners, or caregivers to be involved in their care [9] [**L1, RGA**].

View Pathway

10 Management of ASD

10.1 General Principles of Management

The main goals of treatment are: to improve social communicative function, reduce the impact of repetitive and maladaptive behaviours and promote independent functioning and quality of life[7].

All people with ASD should have a comprehensive assessment which should inform intervention and support individualised goal-oriented care [**R-GDG**].

10.1.1 Early intervention

Early intervention for children with ASD is imperative to minimise the core deficits and maximise functional ability into adulthood[13].

Interventions should be individualised to the patient and should be family-centred [**R-GDG**].

The goals of early intervention are[11,13]:

- Optimise communication ability.
- Promote social interactions.
- Improve play skills.
- Improve independence.
- Inclusion in mainstream education.
- Enhance cognitive development and learning.
- Reduce maladaptive behaviours.

10.1.2 Continuing support

People with ASD typically require multi-agency educational, social care and healthcare support over the duration of their lifespan [**R-GDG**]. Care should continue to be individualised and family centred [**R-GDG**].

Transitions between agencies and services should be coordinated and well planned. Among transition-age adolescents and young adults, consideration should be given to either vocational support or support during continuing education[7] [**L1, RGA**].

A proportion of adults can live independent lives, either with or without additional support from the community[7]. Adults with ASD should be provided with all necessary information regarding vocational, leisure, social and independent living provision[7] [**L1, RGA**].

10.1.3 Collaboration with education and social care

Children with ASD have a right to education and wherever possible, should be educated in mainstream schools with individualised support[15]. Where education cannot be provided in a mainstream setting, specialised educational schools should be provided[16].

Healthcare support should be provided in a school setting to optimise function, this includes[15,46]:

- Therapy services e.g. Speech and Language Pathology (SLP), Occupational Therapy (OT), psychology, physiotherapy.
- Awareness of the child's medication and individual needs.
- Regular communication with the child's healthcare care team.

View Pathway

10.1.4 Care Settings

Interventions can be provided in a variety of settings including, homes, schools and occupational environments as well as healthcare facilities[15,16,46].

Wherever possible, people with ASD should be managed in a community setting in a shared care arrangement with their primary care physician [**R-GDG**].

10.1.5 Interdisciplinary Care

Care should be provided by a multidisciplinary team (MDT) of professionals, using an interdisciplinary approach[14], which has been individualised to the needs of the patient [**R-GDG**]. The patient's parents are important part of interdisciplinary care and the multi-disciplinary interventional approach.

Interdisciplinary care is a complex collaborative process of interaction between different types of staff to share expertise, knowledge, and skills in order to improve patient care and quality outcomes [47]. It is comprised of [47,48]:

- Identification of an MTD leader who establishes a clear direction and vision for the team, while listening and providing support and supervision to other MTD members.
- Demonstration of a team culture and interdisciplinary atmosphere of trust.
- Utilisation of communication strategies (e.g., common terminology) that promote intra-team communication.
- Providing sufficient team staffing to integrate appropriate skills, competencies, and personalities to meet the needs of patients and enhance smooth functioning.
- Sharing professional roles and expertise, planning, and decision-making.
- Delivering quality patient-focused care within complex contexts with documented outcomes.

The MDT may include the following specialists [**R-GDG**]:

- SLP
- OT
- Physio
- Nurse
- Physician
- Psychologist
- Social Worker
- Special Educational Specialist

10.2 Non-Pharmacological Management

10.2.1 Psychosocial Intervention

A specific social communication intervention for core features of ASD should be offered to all children and young people with ASD[6].

Play-based interventions to enhance reciprocal conversation and engagement[2,33,49]:

- Usually start with very basic skills (sitting, looking, listening) and progress towards more complex metacognitive skills.
- Involve varying levels of parental involvement.
- Facilitate the development of interpersonal empathy.

- Can be hold as free-play sessions between a child with ASD and typically-developing children.

The following early behavioural and developmental interventions may also be considered for **children** with ASD [**L1**]:

- *Applied Behavioural Analysis* (ABA)[2,3,7] [**RGA**].
- *Children's Friendship Training* (CFT)[2].
- *Early Start Denver Model* (ESDM)[2,7].
- *Floortime DIR*[7].
- *Learning Experiences and Alternative Program for Preschoolers and their Parents* (LEAP) [2].
- *Lovaas Model*[2,50].
- *Treatment and Education of Autistic and Communication related handicapped Children* (TEACCH) [3,7].

In addition to the list of interventions above, **adolescents** and **adults** may also be offered the following, depending on their needs [2,3,7] [**L1, RGA**]:

- Social skills training.
- Family support and education.

Review the following for adolescents and adults with problematic aggressive, sexualized, repetitive or obsessive behaviour [7] [**L1, RGA**]:

- Social skills training.
- ABA.
- CBT.
- Psychotherapy.

NB: Sustained continuous therapy is more effective than episodic programming[7]. Vocational training and employment are necessary for the continuation of inclusion into society [**R-GDG**].

10.2.2 Parent Educational Intervention

Parent-educational intervention programs should be considered for children and young people of all ages who are affected by ASD, as they may help families interact with their child, promote development and increase parental satisfaction, empowerment and mental health [**R-GDG**]. It must be noted that early intervention is a key to early educational inclusion [**R-GDG**]

Interventions that may be considered include:

- *NAS EarlyBird*[51].
- *More Than Words* (Hanen's program)[2] [**RGB**].
- Parent-mediated or parent-delivered interventions[7].

10.2.3 Alternative Augmented Communication and Assistive Technologies

The following communication methods can be used to assist communication:

- *Picture Exchange Communication System* (PECS).
- Sign language.
- Low- and high-tech assistive devices.

Music therapy may positively affect socio-communication skills in children with ASD. It should be applied with specialist academic and clinical training[7] [**L2, RGA**].

View Pathway

10.2.4 Interventions that are Not Recommended

Clinicians must clearly advocate against any intervention or alternative treatment that may be harmful for the patient or is not evidence-based[7] [**L1, RGA**].

Exclusion diets (e.g., casein-free diet, gluten-free diet) are not recommended as a primary treatment for individuals with ASD due to lack of scientific evidence of benefit[2,7,17] [**L1, RGB**].

If exclusion diets are followed, children should be supported in maintaining good nutrition and a healthy weight [3,7] [**L1, RGA**].

The following therapies are not recommended in treatment of ASD:

- Chelation therapy[2] [**RGC**].
- Hyperbaric oxygen therapy[2] [**RGC**].
- Secretin treatment[2,7] [**RGB**].
- Vitamin and mineral supplementation[18,19] [**RGB**].
- Homeopathy[20,21] [**RGB**].
- Empirical antibiotic and antifungal therapies[17] [**L1, RGC**].

Physicians and parents are advised to interpret unpublished peer-reviewed research reports with caution and discuss treatment approaches with experts [3,7] [**L1, RGA**].

10.3 Pharmacological Management

Pharmacological management should only be undertaken by a developmental paediatrician or psychiatrist working as part of an MDT [**R-GDG**].

10.3.1 Treatment of Core ASD Symptoms

No medication is available to treat core symptoms of ASD. However, medications may influence certain features of a patient's behaviour and comorbid conditions [2,3,7].

10.3.2 Treatment of Comorbidities

Depression and Anxiety:
Treatment with SSRIs should be used selectively in adolescents with depression or anxiety that cannot be managed non-pharmacologically [2,7] [**L1, RGA**]. SSRIs in ASD should only be prescribed by a psychiatrist [**R-GDG**].

ADHD:
Medication to manage ADHD symptoms in individuals with ASD, include:

- *Methylphenidate* [2,7] [**L1, RGA**].
- *Atomoxetine* [2,7] [**L2, RGA**].
- *Clonidine*, *guanfacine*, and *lofexidine* [2,7] [**L2, RGB**].

Challenging Behaviours:
Psychotropic medications should not be used as a primary management strategy for challenging behaviours[7] [**L1, RGC**]. Such treatment should only be started if[7]:

- Other interventions alone are insufficient.
- If the risk to the person or others is very severe (e.g., due to violence, aggression, or self-injury).

Before starting antipsychotics, discuss the benefits and harms with the patient, family members, and carers [7] [**L1, RGA**]. Stop treatment if the patient is not benefiting from taking them [**R-GDG**].

If antipsychotics are required, consider using atypical antipsychotic agents [2,7]:

- Risperidone.
- Aripiprazole.

NB: Antipsychotics should only be prescribed and regularly monitored by a psychiatrist [**R-GDG**].

Sleep Disorders:
Melatonin is recommended to manage sleep disturbances in children with ASD who have insufficient benefit from sleep hygiene routines and behavioural intervention [2,7,22] [**L1, RGA**]:

- It reduces sleep latency (falling asleep).
- It has less effect on the overall duration of sleep.
- It is more efficient when combined with CBT.

Melatonin is recommended for adults with ASD, based on extrapolation from findings in children [2,23] [**L1, RGA**].

Tic Disorders:
No particular treatment differences for treating tic disorders in children or adults with ASD [2].

Epilepsy:
The are no particular differences in the management of individuals with ASD who have epilepsy[22,23]. Individuals with ASD and possible seizures should be referred to neurologists [23] [**L1, RGA**]:

- EEG should be performed only if there is clinical concern about seizures.
- Sleep and metabolic disorders should be considered in the assessment and management of seizures.

10.4 Other Specialist Management

Evaluation by a nutritionist who is familiar with nutrition support for individuals with ASDs is recommended if [17] [**L1, RGA**]:

- Caregivers are concerned about the patient's diet.
- The patient exhibits selectivity of intake.
- The patient is on a restricted diet.

10.5 Information and Support for Caregivers

Caregivers are vital to ensuring optimal health outcomes and access to services for individuals with ASD [**R-GDG**]. A direct correlation exists between symptoms of ASD and parental stress or stress of caregivers, i.e. aspects of the family emotional climate can lessen maladaptive behaviours [24,37].

Interventions that aim to improve the parent-child relationship and encourage expressions of praise may should be offered to families with individuals diagnosed with ASD [24] [**RGA**].

Parents, caregivers, and individuals with autism should be provided with the following information [**R-GDG**]:

- Information about ASD:
    - Risk factors.
    - Diagnosis.
    - Prognosis.
    - Comorbidities.
    - Treatment options.
- Contact details for:
    - Local and national support organisations (e.g. *Qatar Autism Society*, *Best Buddies*).
    - Organisations that can provide advice on welfare benefits (*Qatar Society for Rehabilitation and Special Needs*).
    - Organisations that can provide information on educational support and social care (e.g. *Roua Centre)*.
- Information to help prepare for the future (e.g. transition to adult services).

If an adult patient with ASD *wants* their family to be involved in the care, this involvement should be encouraged. In this case[9]:

- Negotiate confidentiality and sharing of information.
- Explain how to support the person with ASD and help with the care plan.
- Make sure that no services are withdrawn because of involvement of the family, unless this has been discussed and agreed between parties.

If an adult patient with ASD *does not want* their family to be involved in their care [**R-GDG**]:

- Give the family verbal and written information about who they can contact if they are concerned about the person's care.
- Be aware that people with ASD may be ambivalent or negative towards their family.

As the causes of ASD are unproven and susceptibility genes have not been identified, prevention other than avoiding modifiable risk factors is not possible [7].

Parents should be informed that they have an increased chance of having another child with ASD, compared with the general population[6,7,23].

11 Key Considerations for Patient Preferences

Patient preferences refer to patient perspectives, beliefs, expectations, and goals for health and life, and to the steps employed by individuals in assessing the potential benefits, harms, costs, and limitations of the management options in relation to one another. Patients may have preferences when it comes to defining their problems, identifying the range of management options and selecting or ranking the outcomes used to compare these options.

It is important for healthcare professionals to develop an understanding of the patient as an individual and the unique way in which each person experiences a condition and its impact on their life.

The following recommendations are therefore made for physicians and other healthcare professionals regarding general principles of patient care in Qatar. All clinicians and health care practitioners involved in patients' care in the State of Qatar should:

- **Respect Patients:** Treat patients with respect, kindness, dignity, courtesy and honesty. Ensure that the environment is conducive to discussion and that the patient's privacy is respected, particularly when discussing sensitive, personal issues. Ask the patient how they wish to be addressed and ensure that their choice is respected and used.

- **Maintain Confidentiality:** Respect the patient's right to confidentiality and avoid disclosing or sharing patients' information without their informed consent. In this context, students and anyone not directly involved in the delivery of care should first be introduced to the patient before starting consultations or meetings, and let the patient decide if they want them to stay.

- **Clarify Third-Party Involvement:** Clarify with the patient at the first point of contact whether and how they like their partner, family members or carers to be involved in key decisions about their care or management and review this regularly. If the patient agrees, share information with their partner, family members or carers.

- **Obtain Informed Consent:** Obtain and document informed consent from patients, in accordance with MOPH policy and guidance.

- **Encourage Shared Decision Making:** Ensure that patients are involved in decision making about their own care, or their dependent's care, and that factors that could impact the patient's participation in their own consultation and care including physical or learning disabilities, sight, speech or hearing impairments and problems with understanding, reading or speaking English are addressed.

- **Disclose Medical Errors:** Disclose errors when they occur and show empathy to patients.

- **Ensure Effective Communication:** Explore ways to improve communication including using pictures, symbols or involving an interpreter or family members. Avoid using medical jargon. Use words the patient will understand and confirm understanding by asking questions.

- **Ensure Continuity of Care:** Provide clear and timely sharing of patient information between healthcare professionals especially at the point of any transitions in care.

View Pathway

12 Performance Measures

A list of performance measures is given in the table below. Healthcare organisations are encouraged to monitor service performance using the indicator definitions below.

Number	Numerator	Denominator
ASD01	Number of patients with a record of screening for autism at 18 months of age.	All patients aged ≤18 years of age with a recorded diagnosis of ASD.
ASD02	Number of patients with a record of screening for autism at 30 months of age.	All patients aged ≤18 years of age with a recorded diagnosis of ASD.
ASD03	Number of patients with a record of assessment using a validated Screening Tool.	All patients aged ≤18 years of age with a recorded diagnosis of ASD.
ASD04	Number of patients referred to a developmental paediatrician or psychiatrist.	All patients with a recorded diagnosis of ASD.
ASD05	Number of patients with a record of severity classification.	All patients with a recorded diagnosis of ASD.
ASD06	Number of patients who are provided with a specialised ASD intervention.	All patients with a recorded diagnosis of ASD.
ASD07	Number of patients with an active prescription of antipsychotics.	All patients with a recorded diagnosis of ASD.
ASD08	Number of patients receiving education in a mainstream school.	All patients aged ≤18 years of age with a recorded diagnosis of ASD.
ASD09	Number of patients who have a diagnostic assessment started within 3 months of referral to the service.	All patients with possible autism referred for diagnostic assessment.

Table 12.1: Performance Measures.

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Appendix: Detailed Description of the Literature Search

A systematic search for existing literature on ASD was performed in the period March 24th – May 31st, 2019.

The search for clinical practice guidelines on dementia diagnosis and/or management was performed in the *PubMed* database and websites of relevant organisations and societies including the *National Autistic Society*, *Autism Speaks*, *Lovaas Institute*, *Centers for Disease Control and Prevention (CDC)*, *American Academy of Neurology (AAN)* and others. The present guideline is primarily based on UK NICE and British Association for Psychopharmacology guidelines and is supplemented with British Medical Journal (BMJ) recommendations and other relevant studies.

Peer-reviewed scientific publications were found in *PubMed* and via *Google Scholar* Internet search engine. Non-peer reviewed studies were identified in *bioRxiv*. Books were checked on *Amazon* and via *Google* and *Google Scholar* search engines. Personal opinions of healthcare professionals, information published on medical websites, and drug prescribing information sheets were found via Google search engine.

The included publications were identified using the term "autism" and specified with the following terms in combinations:

Autism spectrum disorder, DSC 4/5, ICD-10/11, aetiology, risk factors, presentation, symptoms, comorbid conditions, maladaptive behaviour, alexithymia, investigation, neurological test, neuroimaging, diagnosis, social communication disorder, management, behavioural/educational therapy, MCHAT, social skill training, treatment, epilepsy, seizures, gastrointestinal/sleep disorder, prevention, antipsychotics, caregivers, carers, ethics, multidisciplinary approach/team, care coordination, interdisciplinary/multidisciplinary care, alternative therapy, exclusion diet, music therapy.

Figure A.1 on the next page demonstrates graphically the results of the search and application of exclusion criteria.

View Pathway

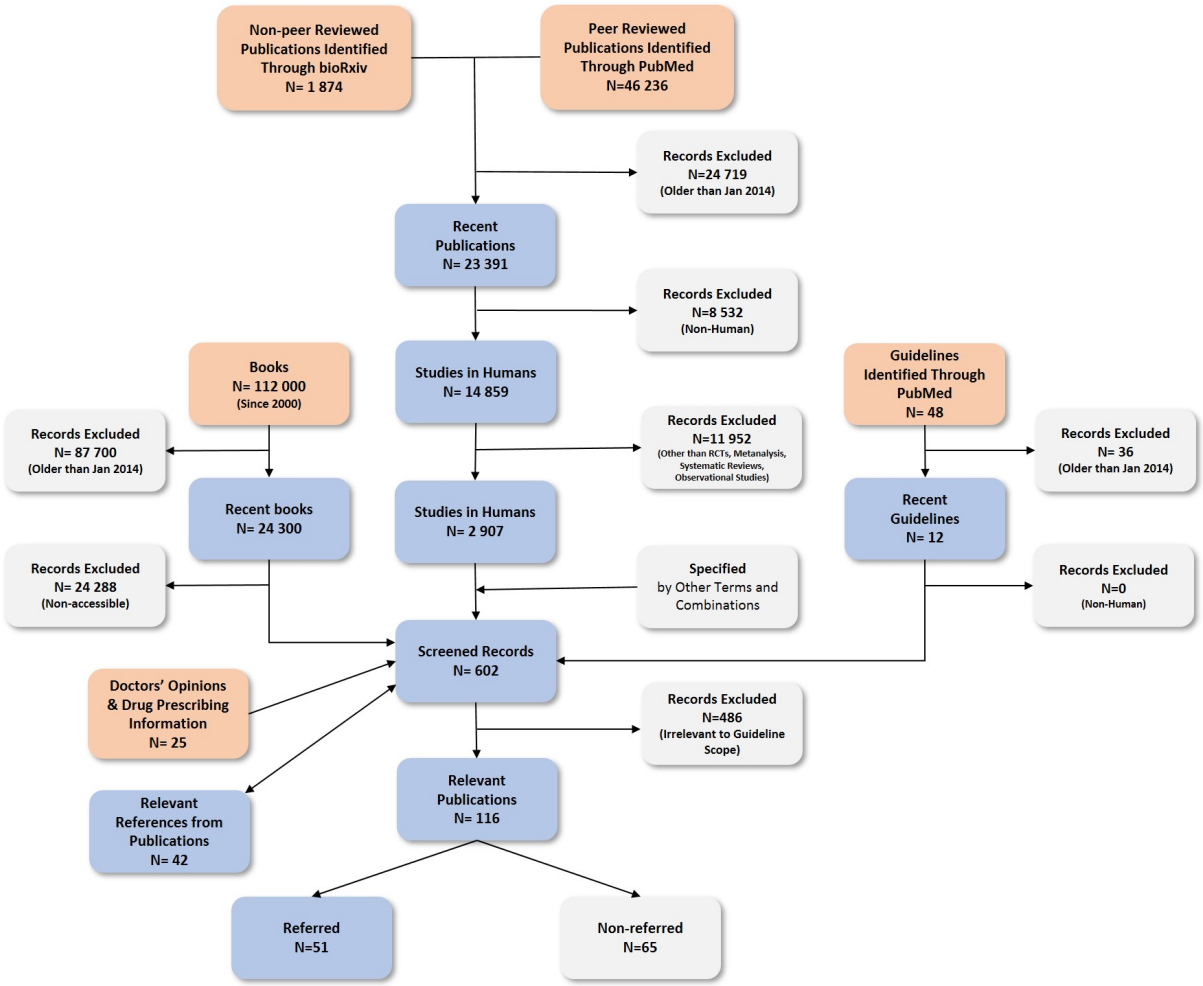

Fig A.1: Literature search results and application of exclusion criteria.

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- **Dr Natalia Siomava,** *Senior Medical Writer.*
- **Ms Rouba Hoteit,** *Medical Writer*

National Lead for Autism Spectrum Disorder:

- **Dr Noof Al Siddiqi**, *Consultant Physician, Hamad Medical Corporation*.

National Lead for Health & Wellbeing of People with Special Needs:

- **Dr Khalid A. Hadi**, *Senior Consultant Head of Audiology & Balance Unit, Ambulatory Care Center, HMC*

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clinicalguidelines@moph.gov.qa