

## Management recommendations

Continuous routine care by a multidisciplinary team is recommended for children and adults with Kleefstra syndrome who have significant behaviour problems and motor disorders.

Specialised neurological and psychiatric care as well as behavioural, speech and language, physio, occupational and sensory integration therapies are advised. As are referrals to early-childhood intervention programs, and special education programs or vocational training.

Interventions used in treatment of autism spectrum disorder, such as applied behaviour analysis (ABA) may be beneficial. Mild to moderate mood and anxiety disorders may respond to interventions such as increased activity. Other alternative therapies such as music therapy, hippotherapy (horse riding) and hydrotherapy (water therapy) can be of additional value.

It is important to access professional care early as this may help to reduce the extent of possible regression. It is vital to seek early treatment for sleep disturbance and/or psychotic illness in adolescence and early adulthood since this may coincide with a sudden decline in functioning. Regression can also follow physical illness or severe depression.

## Medication

Normal to high doses of atypical antipsychotics seem to be most effective for manic and psychotic episodes in Caucasians with Kleefstra syndrome. People with other ethnicities are well treated with a normal dosage. Atypical drugs cause fewer side effects and are well tolerated by people with Kleefstra syndrome.

A study of 24 people with Kleefstra syndrome observed the best effect was given by olanzapine and in some cases by aripiprazole.

Professionals should be alert to possible paradoxical responses to drug therapy commonly used for psychiatric illnesses. This means that the drug has the opposite effect to the effect desired. This commonly occurs in patients with vulnerable brains, such as those with intellectual disabilities, especially when benzodiazepines are prescribed to calm somebody down, although this is not always the case.

**“ As a parent of a child with Kleefstra syndrome, one of my greatest fears is the future, having read about the syndrome and the psychiatric issues that may accompany it. There is a large spectrum of Kleefstra syndrome, both physically, cognitively and with regards to medical/psychiatric complications. None of us can predict if our children will be affected by any of the conditions in this guide, but we can educate and empower ourselves by being prepared. ”**

Dr Miranda Coberman, co-author of *Unique's* 'Kleefstra syndrome and mental health' guide, (from which this shorter guide was developed).

This leaflet briefly summarises possible medical and psychological/psychiatric features seen in children and adults with Kleefstra syndrome. It was compiled in order to help inform parents and involved caregivers about the possible difficulties people with Kleefstra syndrome may encounter. Psychological/psychiatric difficulties occur frequently in people with Kleefstra syndrome. It's important for caregivers and medical professionals to be aware of possible difficulties people may be experiencing to help in everyday situations and to help plan in advance which services to contact in case of emergency.

## Inform Network Support

### Rare Chromosome Disorder Support Group,

The Stables, Station Road West,

Oxted, Surrey RH8 9EE, UK

Tel: +44(0)1883 723356

info@rarechromo.org | www.rarechromo.org

### Website and forum for anyone affected by Kleefstra syndrome:

[www.kleefstrasynndrome.org](http://www.kleefstrasynndrome.org)

This guide is not a substitute for personal medical advice. Families should consult a medically qualified clinician in all matters relating to genetic diagnosis, management and health. Information on genetic changes is a very fast-moving field and while the information in this guide is believed to be the best available at the time of publication, some facts may later change. *Unique* does its best to keep abreast of changing information and to review its published guides as needed. This quick read guide is an adaptation of *Unique's* longer 'Kleefstra syndrome and mental health' and 'Kleefstra syndrome' guides. (AP).

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Understanding Chromosome & Gene Disorders

# Kleefstra syndrome

[rarechromo.org](http://rarechromo.org)

## What is Kleefstra syndrome?

Kleefstra syndrome is a rare genetic condition caused by the deletion of a piece of DNA from chromosome 9 (band 9q34.3) containing the EHMT1 gene, or a disruption of the gene by a mutation (known as a variant) or other chromosomal rearrangement.

The EHMT1 gene plays a vital role in neurodevelopment (development of the brain and nervous system), so changes to its function can result in neurological and physical disorders, as well as behavioural difficulties and psychiatric disorders.

Children and adults with Kleefstra syndrome experience a wide spectrum of medical and mental health conditions together with Intellectual disability (ID) ranging from mild to severe. The degree of ID is not directly related to the other conditions, but may affect the way in which they present.

Symptoms can change over time and the onset of puberty can trigger emotional and psychiatric problems as well as regression in learnt skills.

### Common features

- Developmental delay
- Autism spectrum disorder (ASD) or other neurodevelopmental diagnosis
- Intellectual disability or learning disability
- Delayed or absent speech
- Facial features (e.g. synophrys (hair between eyebrows), microcephaly (small head))

### Possible medical matters

- Heart condition
- Seizures and structural brain abnormalities
- Gastroesophageal reflux (GERD)
- Respiratory tract infections and aspiration reflux
- Constipation
- Hypotonia (low muscle tone)
- Hpermobility (joints move beyond normal range)
- Ears: hearing impairment and/or ear infections
- Eyes: long-sightedness and/or squint
- Urinary tract and/or kidney problems
- Small or immature genitals
- Hernias
- Overheating (under-responsive sweat glands)

## Behavioural symptoms

Children with Kleefstra syndrome are often reported to be of a happy and content character and temperament. They have also been identified as having other behaviours that can have an impact on everyday life, such as those described briefly below. This is not an exhaustive list and not everyone with Kleefstra syndrome will have one or all of these behaviours but most have a few and it's important for carers to understand that they can occur.

### ■ Sleep disturbances

Common disturbances to sleep include problems falling asleep and waking frequently in the night.

### ■ Self-injurious behaviour

Different forms of self harm can occur and may vary with age, such as head banging and scratching.

### ■ Apathy and catatonia

General loss of interest and/or enthusiasm (apathy) and unresponsiveness (catatonia) have been reported.

### ■ Impulsive behaviour

Some children and adults have a tendency to act without thinking or considering the consequences.

### ■ Aggressive/emotional outbursts

Outbursts can occur when someone is having difficulty controlling their emotions and may be associated with nervousness or stress.

### ■ Stereotypical movements

Some children and adults have repetitive movements such as body rocking or hand flapping.

### ■ Chaotic behaviours

Some people have been described as having confused and disorganised behaviour.

Changes in behaviour should be investigated to check for underlying causes. Possible causes are numerous and can range from physical complaints (such as pain, reflux or constipation), to a psychological/psychiatric disorder. Other causes could be related to stress or frustrations associated with comprehension and/or communication difficulties. Some behaviours could also be related to common developmental stages such as temper tantrums at a mental age of 2-3 years.

## Psychiatric/Psychological conditions

As well as having intellectual and speech/language difficulties, children and adults with Kleefstra syndrome commonly have some form of neurodevelopmental disorder or psychological condition such as those described briefly below. Again, this is not an exhaustive list and not everyone with Kleefstra syndrome will have one or all of these behaviours but most have a few and it's important for carers to understand that they can occur.

### ■ Autism spectrum disorders ASD

ASD is a group of complex neurodevelopmental disorders with similar symptoms including repetitive behaviour and difficulties with communication and social interaction.

### ■ Anxiety disorders

Including generalised anxiety and specific phobias.

### ■ Major depression

Extended periods of feeling overwhelmingly depressed.

### ■ Psychosis

Psychotic symptoms vary. Individuals with higher levels of daily functioning can have hallucinations (seeing/hearing/smelling/tasting/feeling things that aren't there), delusions (believing things to be real when they are not), confusion/disturbed thoughts and lack of self-awareness. Those with lower levels of daily functioning often have disorganisation and alterations in normal responsiveness. In most psychotic episodes, sleep problems (with day/night rhythm changes), loss of motivation, apathy and social withdrawal occur.

### ■ Obsessive compulsive disorder

Obsessive thoughts and compulsive behaviours.

### ■ Mania or hypomania (a milder form of mania)

Extended periods of elevated mood and increased energy. This is often accompanied by psychotic symptoms.

### ■ Attention deficit hyperactivity disorders ADHD

People with ADHD experience symptoms of inattentiveness, hyperactivity and impulsiveness.

When a psychiatric condition is diagnosed by a professional, the standard treatment guidelines should be followed. While children and adults benefit from interventions by psychologists and therapists, sometimes a psychiatric condition is severe and needs to be treated with medication.