CONDITION

Congenital rubella

Congenital rubella is an infection passed during pregnancy that can affect a baby's hearing, vision, heart, brain, and growth.

WHAT IT IS
Rubella infection acquired before birth

BODY SYSTEM
Hearing, vision, heart, brain, and growth

MAIN SYMPTOMS
Hearing loss, cataracts, heart defects, developmental delay

WHAT CAUSES IT
Rubella infection during pregnancy

HOW IT IS DIAGNOSED
Rubella antibody testing and PCR, with clinical assessment

MAIN TREATMENT
Supportive care and treatment of affected organs

CAN IT BE CURED?
No - no treatment reverses all effects

IS IT AN EMERGENCY?
Sometimes - breathing difficulty or blue skin

LONG-TERM OUTLOOK
Often lifelong needs; severity reflects affected organs

Overview

Congenital rubella happens when rubella virus passes through the placenta during pregnancy and infects a developing baby. Rubella is also called German measles. It usually causes a mild illness in children and adults, but infection during pregnancy can have serious effects on fetal development.

The risk is greatest when rubella occurs early in pregnancy, particularly during the first trimester. This is when major organs are forming. Infection later in pregnancy is less likely to cause the classic pattern of birth differences, but specialist assessment may still be needed.

A baby can have congenital rubella infection without obvious problems at birth. The term congenital rubella syndrome , or CRS, is usually used when the infection causes a pattern of health conditions. These most often affect hearing, eyesight, the heart, growth, or brain

development.

The effects are different for each child. Some have one main problem, such as hearing loss. Others have several medical or developmental needs. Certain problems are noticeable before or soon after birth, while hearing, learning, hormonal, or developmental concerns may appear later.

Congenital rubella is not inherited through genes. It results from infection during pregnancy.

Symptoms

Some babies with congenital rubella are smaller than expected at birth. Others may initially appear well. Symptoms depend on which organs were affected and when the infection occurred.

Possible signs and health conditions include:

A patent ductus arteriosus is a blood vessel near the heart that normally closes after birth but remains open. Some small openings cause few symptoms. Larger ones can make feeding and breathing harder or place extra strain on the heart.

Cataracts make the normally clear lens of the eye cloudy. They can interfere with sight, particularly if not found and managed early.

Hearing loss may not be obvious in a newborn. It can affect one or both ears and may become clearer as speech develops. This is why repeated hearing checks can matter even if the first screening result was normal.

- Hearing loss , often caused by damage to the inner ear
- Eye conditions , including cataracts, glaucoma, or damage to the retina
- Heart differences , especially a patent ductus arteriosus or narrowed lung arteries
- Developmental delay , learning difficulties, or a smaller-than-expected head
- Poor growth before or after birth
- Feeding difficulties
- Low muscle tone or movement difficulties
- Jaundice, which causes yellow skin or eyes
- An enlarged liver or spleen
- Low platelets, which may cause easy bruising or purple-red skin spots

- Inflammation involving the brain or its surrounding tissues

Causes and risk factors

Congenital rubella is caused by rubella virus reaching the fetus through the placenta. This can happen when a pregnant person catches rubella, including when their symptoms are mild or absent.

The timing of infection is the most important risk factor. Infection early in pregnancy is more likely to interfere with organ formation and cause several effects. The chance and pattern of harm generally decrease as pregnancy advances.

A pregnant person is more likely to catch rubella if they are not immune and have close contact with an infected person. Immunity usually comes from vaccination or a previous rubella infection. Rubella can spread through coughs, sneezes, and close contact with respiratory secretions.

Living in or travelling to a place where rubella continues to circulate may increase exposure. Outbreaks can also occur where vaccination coverage has fallen.

Having congenital rubella in one pregnancy does not mean it will automatically happen again. Future risk is linked to whether the pregnant person is immune to rubella, not to an inherited family trait.

Diagnosis

Congenital rubella is diagnosed using laboratory tests together with the baby's examination and medical history. Symptoms alone are not enough because other infections and health conditions can cause similar findings.

Tests may include:

A positive IgG result shortly after birth does not confirm congenital infection by itself. These antibodies may have come from the pregnant parent and gradually disappear. Test timing and interpretation therefore matter. Public health teams may help coordinate testing because congenital rubella is a notifiable condition in many countries.

During pregnancy, blood tests can help assess whether the pregnant person has rubella antibodies or evidence of recent infection. Results are not always straightforward. For example, an IgM result can occasionally be falsely positive. Repeat testing, an IgG avidity test, or specialist virology advice may be used to clarify when infection occurred.

Ultrasound may identify growth problems or some organ differences before birth, but a normal ultrasound cannot rule out congenital rubella. Hearing loss and several other effects cannot be reliably excluded by prenatal imaging.

After birth, the baby may also have hearing tests, an eye examination, an ultrasound scan of the heart, blood tests, and developmental assessment. These tests identify which areas need treatment or monitoring; they do not all confirm the infection itself.

- A blood test for rubella-specific IgM antibodies , which the baby produces in response to infection
- PCR testing , which looks for the virus's genetic material in samples such as a throat swab or urine
- Follow-up blood tests showing rubella IgG antibodies remain longer than expected from antibodies passed through the placenta

Treatment and management

There is no antiviral treatment that removes congenital rubella or reverses all effects of infection before birth. Treatment focuses on the health conditions it caused and on supporting development.

Care may involve several services:

Treatment is based on the child's particular findings rather than the infection label alone. For example, not every patent ductus arteriosus needs an operation, and the best hearing support depends on the type and degree of hearing loss.

Babies with congenital rubella can release, or shed , virus in urine and secretions from the nose and throat for a prolonged period. The child's healthcare and public health teams may arrange repeat testing and give practical infection-control advice. This is especially important around pregnant people who may not be immune.

Routine vaccination does not treat congenital rubella that is already present. A child with congenital rubella can still need other vaccines according to the local schedule and their medical circumstances.

- A heart specialist may monitor a heart difference or recommend a catheter procedure or surgery
- An eye specialist may treat cataracts, glaucoma, or other vision problems
- Hearing support may include hearing aids, communication therapy, or cochlear implants

- Physiotherapy, occupational therapy, and speech and language therapy can support movement, daily skills, feeding, and communication
- Dietitians or feeding teams may help when growth or feeding is difficult
- Developmental and educational services can provide early, tailored support
- Hormone specialists may monitor or treat thyroid problems, diabetes, or growth concerns if they develop

Complications

Possible long-term complications include permanent hearing or sight loss, heart strain, developmental disability, movement difficulties, and challenges with speech or learning. The type and severity of these effects are not the same for every child.

Some concerns may emerge later. These include progressive hearing loss, thyroid disease, diabetes, eye problems, or changes in behaviour and learning. Later problems are possible rather than inevitable.

Heart disease, severe feeding problems, and liver or blood abnormalities may need closer attention during infancy. Early recognition and treatment can reduce the effect of some complications, although it cannot undo the original infection.

Prevention

Congenital rubella is largely preventable through rubella vaccination. The rubella vaccine is usually given as part of the combined measles, mumps, and rubella vaccine, known as MMR. High vaccination coverage also reduces circulation of the virus in the wider community.

People planning a pregnancy can have their vaccination record or immunity checked if it is uncertain. MMR is a live vaccine and is not routinely given during pregnancy. Anyone vaccinated before pregnancy should follow local advice about how long to wait before trying to conceive.

If testing during pregnancy shows that someone is not immune, vaccination is usually offered after the pregnancy to protect future pregnancies. It cannot prevent congenital rubella in a pregnancy where fetal infection has already occurred.

If you are pregnant and may have been exposed to rubella, contact your maternity service promptly. Do not rely on whether you developed a rash, because rubella can cause few or no symptoms. Testing and advice should be based on the exposure, your vaccination history, and

appropriately timed blood tests.

Congenital rubella itself cannot be prevented through diet, supplements, hygiene alone, or changes made by the baby's family after birth.

Living with it and what to expect

The course of congenital rubella depends mainly on which organs were affected. Some children need limited follow-up for one condition. Others need ongoing care from heart, hearing, eye, developmental, and educational services.

The infection itself does not keep damaging every organ throughout life. However, damage that happened before birth may be permanent, and some effects become clearer as a child grows. Hearing or learning difficulties, for example, may be easier to recognise when communication and school demands increase.

Early childhood often involves regular hearing, vision, growth, and developmental checks. Appointments may become less frequent when health conditions are stable, although certain monitoring can continue into adulthood. Planned follow-up is different from urgent care and does not mean that a complication is expected.

Many children attend school, build relationships, and take part in family and community life. Some need hearing or visual aids, classroom adjustments, communication support, help with daily activities, or long-term medical care. The amount of independence possible in adulthood reflects each person's hearing, vision, heart health, learning, and movement abilities.

Adults with congenital rubella should keep a clear record of their heart, eye, hearing, and developmental history. This can help when moving from children's services to adult care or when seeing a new healthcare professional.

When to get medical help

Call emergency services if a baby or child:

Seek urgent medical assessment if a baby is feeding much less than usual, sweating or breathing rapidly during feeds, producing fewer wet diapers, becoming increasingly yellow, or developing unexplained bleeding or widespread purple spots. These signs can have several causes but need prompt attention.

Contact the child's regular healthcare team soon if you notice a change in hearing, vision, balance, growth, feeding, or development. Loss of a skill the child previously had also needs

assessment. These concerns usually require a timely appointment rather than emergency care unless the child is acutely unwell.

Keep routine follow-up appointments even when the child seems well. Hearing loss, eye changes, thyroid problems, and developmental needs may not cause clear early symptoms.

If you are pregnant and develop a rash or have close contact with someone who may have rubella, contact your maternity service or public health service promptly. Call before attending in person so that staff can reduce the chance of exposing other pregnant people.

- Is struggling to breathe, has pauses in breathing, or has blue or grey lips
- Is difficult to wake or suddenly becomes unresponsive
- Has a seizure that lasts several minutes or repeated seizures without recovering
- Collapses or develops a sudden major change in alertness

Common questions

Can a baby with congenital rubella look healthy at birth?

Yes. Some babies have no obvious signs during the newborn period. Hearing loss, eye problems, developmental differences, or other effects may be found through screening or become apparent later. Follow-up is important even when the first examination is reassuring.

Is congenital rubella contagious?

The birth differences themselves are not contagious, but an infected baby may shed rubella virus in urine and respiratory secretions for many months. Public health or infection specialists can advise about testing, hand hygiene, childcare, visitors, and contact with pregnant people who may not be immune.

Can congenital rubella be cured?

There is no treatment that reverses the entire condition. Some individual effects can be treated effectively. Cataracts may be removed, certain heart differences can be repaired, and hearing or developmental supports can improve communication and daily life.

Is congenital rubella genetic?

No. It is caused by rubella infection during pregnancy, not by a changed gene passed through a family. A parent cannot pass the condition to future children through inheritance.

Can congenital rubella be detected before birth?

Testing can sometimes show that rubella infection occurred during pregnancy, and ultrasound may find certain fetal problems. However, prenatal tests cannot always predict whether the

baby will be affected or how severe the effects will be. Specialist interpretation is needed.

Will a child with congenital rubella always have a disability?

No single outcome applies to every child. Some have one manageable condition, while others have combined hearing, sight, heart, or developmental needs. Assessment over time gives a clearer picture than findings from one early appointment.

Sources

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