Wendy Fidler looks at health and learning issues for children with Down Syndrome (DS) and the implications for Montessori settings.

Down Syndrome

Down Syndrome (DS) is a genetic condition that causes delays in physical and intellectual development. Usually identified at birth, the initial diagnosis is based on the child's floppy muscle tone, protruding tongue, irregular ear shape, slanting eyes and flattened facial features. The diagnosis is confirmed by a chromosome study called a karyotype.

What are the causes of DS?

DS is caused by an error in cell division at the time of conception. DS is not caused by anything the mother has done during pregnancy. Three kinds of irregular cell division can cause DS - all involve chromosome 21:

- Trisomy 21: This is the cause in more than 90 percent of the instances of DS. The sperm and egg unite and form a fertilized egg, but rather than two, three chromosomes 21 are then present. The cells divide and the extra chromosome is then found in every cell.
- Mosaic Trisomy 21: This form represents less than two percent of DS cases. The difference between this form and Trisomy 21 is that the extra chromosome is only found in some of the cells, not all of them.
- Translocation Trisomy 21: This one represents three or four percent of all DS cases. In this variety, a portion of the chromosome 21 gets attached to another one (either the 13th, 14th or 15th), either at conception or sometimes before. The carrier of the extra chromosome has 45 chromosomes rather than 46. However, they have the genetic material of the person who has 46. The carrier has the extra genetic material, but just a single chromosome 21. The carrier never exhibits the symptoms of DS, since his genetic material is the right amount.

If a mother has a DS child due to Translocation Trisomy 21, future pregnancies have an increased risk of producing DS children. The reason is that at least one parent is likely to be a balanced carrier. If the father is the carrier, there is a three percent chance of producing a DS child. If the mother is the carrier, there is a twelve percent chance.

Above: Children with DS have two speeds, slow and slower – there is always time to stop and marvel at everything they see.

Right: Children with DS explore and reflect deeply, using all their senses.

How does DS affect children's health, development and learning?

Health

A few children with DS have generally good health, but most have health complications. Up to forty percent have congenital heart defects. Children with DS have a higher incidence than non-DS children of infection, respiratory, vision and hearing problems. Many also have epilepsy, thyroid and other medical conditions. Children with DS are prone to gastrointestinal problems and may require special dietary monitoring to avoid constipation, diarrhoea, abdominal pain and other GI symptoms.

Development

Most children with DS experience developmental delays and benefit from attending special or adapted education classes. Many benefit from attending Montessori classes; this is because DS children get frustrated easily and upset if their work is too different from others – they dislike being singled out. In Montessori classes each child works individually on tasks which are suited to his or her developmental stage. Each child with DS is different and many have exceptional creative gifts and talents, especially in art, music and dance.

Learning

Most children with DS have mild to moderate cognitive impairments; there is an extremely wide disparity from almost imperceptible to severe or profound. Children with DS have two

Facts and Figures

- **DS is a chromosomal anomaly in which there is a third copy of chromosome 21 in the cells.**
- **DS is the most frequently occurring chromosomal disorder.**
- **One in every eight hundred children is born with DS.**
- **Children with DS have 47 chromosomes instead of the usual 46.**
- **The incidence of DS increases with advancing maternal age.**
- **Eighty percent of children with DS are born to mothers under thirty-five years of age.**
- **The number* of babies in England and Wales being born with DS - about two births a day - has risen to a higher level than in 1989 when pre-natal screening was widely introduced.**
- **The increase is spread across all age groups.**

* Figures from the National Down Syndrome Cytogenetic Register on the number of births can be found at: http://www.wolfson.qmul.ac.uk/ndscr/reports/NDSCRreport06.pdf

speeds – slow and slower. The concepts of 'hurry' and 'fast' do not exist. Flowers are there to be smelled, paintings to be admired and music to be enjoyed (repeatedly). Structure and order are keys to their successful learning, cooperation and independence. Children with DS like things to be 'just so', on time and well organised and for this reason they settle into Montessori classes very easily. DS can also co-exist with other learning difficulties such as autism. ■

Resources:

Down Syndrome Education International
http://www.downsed.org/

Bibliography:

Montessori, M (1913), *Pedagogical Anthropology*, William Heinemann, London

Montessori, M (1965), *The Advanced Montessori Method Volume 1*, (Formerly Spontaneous Activity in Education 1917), Shocken Books, Random House, New York

To comment on or discuss this article, contact **Wendy Fidler** at wendyfidler@eight29.com or 0208 858 4368/07710 433 994

What are the implications for DS children in Montessori settings?

Issue: Children with DS are visual learners

Action: Keep an open mind and don't be afraid of improvising and adapting. Maria Montessori advised us to be scientific pedagogues. She designed her learning materials based on her observations of children with special needs; we should not be surprised, therefore, that children who learn visually are stimulated by and succeed with conceptual learning when using the Montessori sensorial materials.

Issue: Children with DS have difficulties with communication

Action: Ensure children with DS spend as much time as possible with 'typically developing' non-DS children. DS families are the experts – because they have to be – so build rich relationships with parents and open as many lines of communication as possible. Home-school books provide the best means of long term communication and are invaluable for compiling historical observation reports.

Issue: Children with DS are refreshingly honest and genuine

Action: Remember that children with DS take things at face value- they are straightforward and unpretentious. There is no undue modesty – when they have achieved well they will let you know!

Case Study

I visited Martha at Caterpillars Montessori in Hampshire. Martha's one-to-one aide was not present during my visit, but it was evident that the advice given by Martha's parents and by the professionals at DownsEd had been fully taken on board. Martha, like all children with DS, is a great risk-taker and the Caterpillars Montessori teachers confidently provided a protective, consistent and stimulating environment in which Martha excelled.

Following my visit I interviewed Martha's mother:

Q. What works well?

A. Well pretty much everything. We have really good communication with the nursery and I update them regularly on her progress outside of school and things we are working on at home or with DownsEd, and they also talk to us regularly about what she is doing there (as she cannot tell us). We have a fantastic home/school diary - not completed every day or even every week but when there is something to talk about. It's a way to help Martha 'talk' to nursery about what she is doing at home, and to tell us at home what she has done at nursery. We stick in photos and drawings and put simple wording in from Martha's point of view, to encourage her to 'read it' to us. So for instance if we go to the beach we would put in a photo of Martha playing in the sand with words underneath 'I played on the beach', or similar.

Q. What proves tricky?

A. I think as a parent the hardest thing is that she cannot tell us what she has been doing, or if she is struggling with anything, or who her friends are etc., which is why we rely on good communication with the nursery school.

Q. What do you think Martha has gained most?

A. She has gained from mixing with children and being encouraged to be independent. She learns visually so it has been great for her to be able to copy/learn from the other children and to gain confidence away from her parents. She has been encouraged to be independent at nursery and they treat her the same as the other children in that respect. Her confidence and her abilities have grown and she is a different child to the one who started in January last year.

Q. What difference have the links with Down Syndrome organisations made when working alongside Montessori?

A. We work closely with DownsEd in Portsmouth - I feed back to Caterpillars what we are working on and our priorities for Martha. However we haven't insisted that they do any of her DownsEd homework as we think it is just as valid for Martha to be doing normal nursery activities and to learn from the Montessori methods, many of which suit her strengths of visual learning.

Key ideas: Communication, visual learning, copy/learn from other children, independence, confidence.

Creativity and reflection are major strengths of children with DS

PHOTOS COURTESY OF CATERPILLARS MONTESSORI, HAMPSHIRE