

THE AADMD

Newsletter

ISSUE

VOLUME

2



Down Syndrome

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Hibatallah Fathy Mahmoud

Dr. Mennatalla Omar

- **Dental intern (University Dental Hospital, Sharjah - UDHS)**
- **Former general secretary USDSA (2017/2018) & GDSA (2018/2019)**
- **Former executive secretary of 2018 6th ISDC**
- **Organizer of ConsAsia 2018**
- **Dental volunteer in Sri Lanka Mission of Mercy & Special Smiles program in the 2019 Special Olympics**
- **Winner of the USDSA Excellency Award and the Dean's Achievement Award**



AADMD: UOS Student Chapter

Dr. Mennatalla Omar

DIRECTOR OF MEMBERSHIP

What was the influence behind becoming a board member in the association?

I've always been passionate about working in associations throughout my undergraduate years and I'm always making a conscious effort to be part of events. I had the pleasure of being introduced to the AADMD during my volunteering work in the Special Olympics, and this is when I realized I wanted to contribute to this phenomenal team and help make a difference in our community through my work.



What makes AADMD special?

The uniqueness of this academy is what makes it special, as it's the only association in the entire MENA region that is designed to bridge the gap between the people of determination and the community. Its' noble mission to educate and empower healthcare providers through necessary skills to deliver a better care to the people of determination is what sets the AADMD apart from any other association.

How do you plan to attract more people to the association this year?

As the director of membership my plan is to reach as many people as possible not only in the UAE but in the entire Middle East. We are planning on opening a YouTube and TikTok page to post mini educational series, which will give us a bigger platform across the entire globe. Moreover, we are planning on collaborating with social media influencers; especially those who have first-hand experiences with people of determination. Thus, they can share their experience as caregivers, volunteers and spokespeople.

What impact did your work with people of determination have on your personal and professional life?

I recall the time I had to treat a mute patient. In the beginning, I wasn't sure how I was supposed to communicate with them, so I was depending on their parent to tell me what their child needs. Then, a colleague of mine gave me the idea of asking the patient to write whatever was on their mind on a piece of paper. At that moment, I thought it was a brilliant idea; I could tell immediately it made them happy to be able to communicate directly with me. This experience made me realize that, more often than not, the simplest ideas could make a situation much easier; all it takes is for us to think of the whole picture.

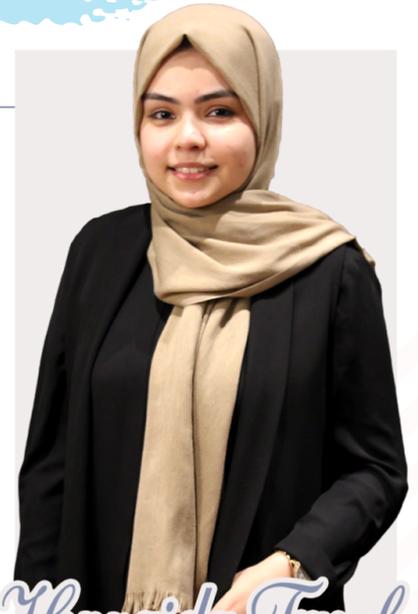
What do you plan for the future of your career?

For now, I'm taking it day by day and I'm seeing where life takes me. However, I would like to experience work abroad to see how things are done differently from here, and to further develop my skills in all aspects of dentistry. Despite that, I know I would always be keen to continue my humanitarian journey by being part of honourable associations like AADMD.



Huwaida Fazel

- Senior year medical student (UOS)
- Peer advisor at the College of Medicine (UOS)
- Former head of research at the Research and Development Association
- Former head director of the Medical Students Research Program
- Former head assistant of the Standing Committee of Public Health



Huwaida Fazel
MEDICAL CHAIRMAN

How did you hear about AADMD?



AADMD: UOS Student Chapter

It was in 2018 that I've seen an announcement for an Arabic Sign Language Workshop arranged by the AADMD. I was immediately drawn in, signed up for it, and invited my friends to do the same. I was only hoping to learn the basics of the sign language. The experience was a pleasant one and had surpassed my expectations. In that workshop, and in the few other activities I had joined subsequently, I found a warm welcoming environment of unprejudiced and accepting people, with admirable work ethics, and praiseworthy goals. It is my honor that I am part of this special family today and that I get a chance to positively contribute to our aims, simply put as: to accept, educate and empower people with intellectual and developmental disabilities.

If there is one piece of advice that you can give our readers, what would it be?

To ask: ask the right questions, ask for help when needed, ask what you can do more, ask how you can do more. Embody gratitude; instead of saying, "I have to do this", say, "I get to do this". Acknowledge your privileges, realize your potentials, and lend a serving hand to those who need it.



What challenges are you intending to tackle as the medical chairman of the association?

It is worthy of mentioning that the biggest challenge that the People of Determination face is the social stigma attached to their disabilities and the hesitancy to have them accepted as part of the community. The UAE is fortunately a pioneer in empowering them and in meeting their needs. The friction that remains, and the root cause of such stigma, does not come from hatred or malicious intentions. Far from that, it is simply lack of awareness and education. Accepting and empowering People of Determination are only natural outcomes of education. As a medical chairman, my core goal is to shed light on some of their conditions with evidence based medicine. The why, the how, and the who; answering such basic questions can help us move forward as a community.

Where do you see the AADMD in the next few years?

In the near future, I envision AADMD as a household name in leading positive campaigns towards our collective ambitions. I envision a larger team involving a variety of roles. I also envision international collaborations, and involvement in larger scale projects. I hope to see AADMD as a pioneer in providing solutions for the challenges faced by the People of Determination, and I see this through our continuous commitment to meet our constant goals. In a nutshell, it's only up from here.

What are your inspirations in your daily life?

As cliché as it might sound, what inspires me the most in this journey is the selfless and unending love parents have for their children, and the care and attention healthcare professionals provide for their patients. As a result, I am grateful that the AADMD empowers caregivers too. Learning on a daily basis is another persistent source of inspiration in my life.



Dr. Mohammad Wazzan

- **Dental intern (University Dental Hospital, Sharjah - UDHS)**
- **Former general secretary of USDSA (2016/2017), GDSA (2017/2018), Hult Prize UOS (2019), Hult Prize UAE (2020)**
- **Former president of the USDSA (2017/2018)**
- **Former member of the UOS College council**
- **Member of the organizing committees of more than 5 conferences**



Dr. Mohammad Wazzan
— DIRECTOR OF VOLUNTEERS

What do you plan for the AADMD volunteering agenda this year?

This year is filled with difficulties and challenges. My plan for the AADMD this year is to still be able to deliver the quality volunteering opportunities our members want to participate in, whilst facing all the precautionary measures to keep everyone safe. We are speaking with many centers to see how we could come to a solution that satisfies all criteria including government legislation.

Which aspect of The AADMD do you believe provides the most influence?

The AADMD gives everyone a chance to participate in understanding more about the people of determination, as well as learning about our responsibilities as health care providers in knowing how to cater to them and their needs. This topic may not be so widely accessible in university curriculums, so getting this experience outside is crucial.



How did your mentality change about people of determination since joining the association?

My mentality completely changed after my first volunteering experience, I was educated about just how far these beautiful people want to push to reach their goals, and how nothing can stop them as long as we provide the right environment. Therefore, it is our RESPONSIBILITY as a community to provide an inclusive environment.

What was your most memorable volunteering experience?

My most memorable experience is definitely volunteering at the Special Olympics' Special Smiles program. Prior to that experience, I had not been in contact with many people of determination. That experience gave me the chance to engage, communicate and support very strong individuals that were representing their countries in one of the biggest sport tournaments in the world. Seeing firsthand how determined they were to achieve their goals was, and still is, extremely inspirational.

What does leadership mean to you?

To me, leadership is less about the leader and more about the people you are leading. Once you are able to take yourself out of the equation, and understand that your role as a leader is provide the uniquely perfect environment for everyone in your team to shine, then you will be a good leader.



Community's Voice

A DAY INTO A FAMILY'S LIFE



Ayah Deeb and Khadijah O. Zaidan



Parents, Teachers, and healthcare providers impact a huge part of People with determination. Therefore, in this segment we are focusing on a mother who knew immediately after giving birth that her daughter Noura was born with down syndrome, hence, left her in a shock for a while. However, now Noura's mom is a working mother who says that her strength was inspired by her daughter Noura. She has spent years studying more about down syndrome and she is a firm believer in her daughter. As Down Syndrome Awareness Month winds down, we caught up with Noura's mom to ask her about her experiences and concerns



What was your reaction when you found out that your child has down syndrome?

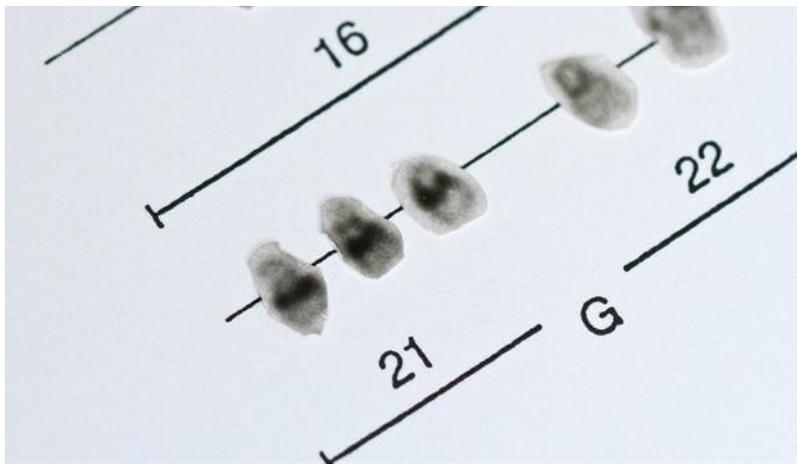
The pediatrician told me immediately the day after giving birth that my beloved daughter may have down syndrome, however, my reaction was total disbelief. she was telling me all the physical features that she has, and I was telling her that she looks like her sisters and her father. She told me that her eyes are wide apart, and I told her sister has the same feature, she told me that she has Sandal toes, and I told her that her father has the same feature. I was in total confusion and I remember how much I have cried, every day and everywhere, I used to visit her at the hospital on daily basis, and honestly, I felt like my life has stopped until I received the cytogenetics test results. That is when I stopped crying and accepted her; after two weeks.





What do you love the most about your child?

I remember when she was four years old, I used to take pictures for her everyday morning before getting into the car to go to school, and I liked when she was posing for the camera, so adorably. I like that she does not hate me despite all the fights during the day. I like the way she loves her little brother. I like that she likes to watch football games and really enjoy them. I like the way she dances to the old Arabic songs (Badawi songs). I just love her.



What daily challenges do you face with your child?

As any child, the daily challenges differ as she grows up, but now at the age of 11, she is developing her personality and this has turned into stubbornness (laughed) she is very stubborn and doesn't listen, although she understands what I'm or her father is saying. She is non-verbal which sometimes makes it harder for her to express what she is feeling. She really loves food and eating, which is a challenge for me to keep her always on a healthy diet. She is totally not organized and does not like to see her surrounding place organized





Are there any misconceptions about Down syndrome that you would like to correct?

People with Down Syndrome are human beings, very simple, and loving persons. They are the same as other children, friendly like to go out, and like to interact with others. Yes, they have challenges, and they are delayed in achieving the expected milestones, but surely, they will be there one day. They might not be perfect; but who is! They do not need your pity; they need your support and understanding. They have different levels of verbal and cognitive abilities, like other children. Most importantly, they are the creation of Allah, not the mother or the father's fault. They are blessings never a curse. If they receive the correct guidance, they have the ability to develop like others, maybe slower, but they do



Do you have any advice for other parents who are expecting or have a child with down syndrome?

I would like to tell all the parents who are expecting a child with Down's syndrome, please don't abort your unborn child because you are going to find him/her as a blessing. Always remember it is not your fault, its Allah willing. I know that it is not easy, indeed it is very difficult, but you can do it. Yes, your life will not be the same anymore. But educate yourself and your family about it and get support from the right people. Start with early intervention as early as you can, and get involved in your child's therapy, you are the best teacher for your child. Don't blame yourself. and most importantly, Love your child.





Public Figures:

AMBASSADORS OF CHANGE



Sarah Safaa Jumaah

With all of the trials and tribulations individuals with Down's syndrome face, nothing can hold them back from excelling at their field and carrying the flag of compassion across to everyone. In this issue, we have decided to shed a light on some of the amazing talents in the community.

Lauren Potter (Actress):

Lauren Elizabeth Potter is an extremely talented actress who has been a fan favourite for her witty character as "Becky Jackson" on FOX's hit T.V series "Glee." Her debut was when she was only 16 in a powerful coming-of-age movie titled "Mr. Blue Sky." In addition to acting, she is a member of the President's Committee for People with Intellectual Disabilities and was an ambassador for the 2015 Special Olympics in Los Angeles. She has advocated against bullying and the use of the "R-word" as a derogatory term.



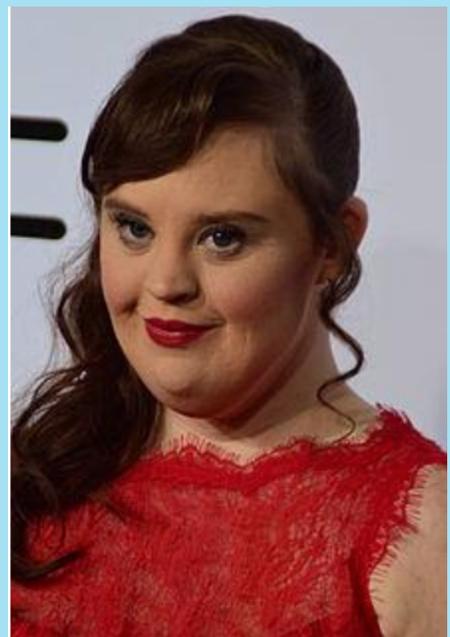
Angela Bachiller (Politician):

Ángela Covadonga Bachiller is the world's first elected city councillor with Down's Syndrome. She has been a member of the People's Party in Spain since the 29th of July 2013. The inclusion of Angela within the government's body has restored the Spaniard's faith in the government, as her message of social equality inspires many and challenges all social taboos and cliches in today's modern society. In addition to her important role in the government, she is a mother of two. Even with her busy life, she manages to dedicate time for her hobbies, which include reading and travelling.



Jamie Brewer (Actress/Model):

Jamie is an actress most known for her roles in FX'S horror television series "American Horror Story." Later appearing on other shows including "Southland," "Raymond and Lane," "Switched at Birth," and her first Off-Broadway play "Amy and the Orphans." She also became the first woman with Down's syndrome to walk the red carpet at the New York Fashion Week in 2015. She has been a role model to many, inspiring people from all backgrounds to pursue their dreams, as she said during an interview, "Young girls and even young women [see me] and say 'hey, if she can do it so can I'. It's a true inspiration being a role model for any young women to [encourage them] in being who they are and showing who they are."



Science Speaks

MEDICAL RESEARCH



Mohamad Monif Assker



The More the Merrier

The merry starts with 21, first described extensively by Langdon Down in 1867 with his genetic regression hypothesis, which was rather inaccurate but helped guide others to properly spot and diagnose a newborn with down syndrome. Normally, a person's genetic material is bundled up and wrapped into dense rolls of genetic material called chromosomes, half of which are paternal while the other half being maternal, for a total of 2 copies per chromosome. In Down Syndrome (DS), a random alteration in the process of evenly distributing this genetic material occurs, causing an excess generosity at the 21st location of distribution, resulting in 3 instead of 2 copies of that chromosome. The reason behind this random alteration is still a controversy, but conceiving a child by a mother who passed the age of 35 is proved to play a major role in developing DS. One study had found an association with folate metabolism issues (a substance required for development of the fetus during pregnancy) that may have been associated with DS, but such findings were not replicated yet.



Even though there is no actual strong evidence regarding a specific trigger for DS, it is still considered to be the most common chromosomal condition diagnosed in the US specifically [1 in every 700 babies] and across the globe [1 in every 1000 babies]. Shedding light on screening pregnant ladies becomes of vital importance with regard to the aforementioned numbers, and tools aiding this were first introduced in the 1970s. Taking a sample of the amniotic fluid (surrounding the fetus) during its 2nd trimester was the norm. This was a highly invasive procedure with its fatal risks on both the mother and her child. Recent progress drove such diagnostics further by only requiring a blood sample from the mother to be sent out for analysis combined with an ultrasound of the 13-week-old fetus to check for fluid behind the baby's neck [termed nuchal translucency]. Any positive results would prompt examining placental, umbilical and amniotic material to finalize the diagnosis.





One In a Million

Regardless of the variance in a DS child's appearance, they're easy to spot. They have characteristic features that may be described in the scope of the following:

1. Head and Face

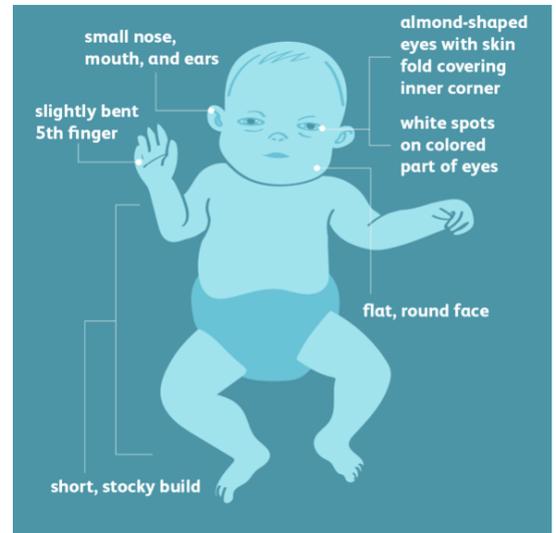
- Short skull flattened at the back
- Small, round, low ears
- Small mouth
- Flat nose bridge
- Almond shaped eyes slanting upwards
- White spots on the colored part of the eyes
- Short neck

2. Extremities

- A solitary crease across the palm
- Sandal gap between 1st and 2nd toes

3. Development

- Short stature averaging at 150 cm
- Higher tendency of being obese
- Varying intellectual disability



Hopeful Prospects

It only goes up for Down's. As of recently, genetic studies conducted had revealed more about the genes being overexpressed because of the trisomy. The role of such genes in different tissues like brain and nervous system was analyzed and reasons behind DS presentation became more clear, and allowed to specifically target the cognitive areas of impairment during therapy to manage DS, some of those newly found relations are:

Overexpressed DYRK1A gene was studied as the culprit in developing learning difficulties.

APP gene abundance increased the chances of developing Alzheimer's disease.

CRELD1 was associated with heart defects.

AGTR1 was related to developing hypertension.

GATA1 mutations were proved to cause leukemia and cancer.

Treating mice DS models with picrotoxin or pentylentetrazole improved their learning capacity. The complexity in treating DS once resided in the complexity of its genes, but with genes unraveling, treating DS will -very soon- be at hand.



Science Speaks

DENTAL RESEARCH



Hibatallah Fathy Mahmoud

Down syndrome (DS) [trisomy 21], coined after Dr. John Langdon Down (1866), is the most prevalent genetic cognitive disability worldwide¹. DS is characterized by a number of characteristics listed as follows;

 Craniofacial Characteristics	 Oro-dental Characteristics	 Cognitive, physical and behavioral impairment
<ul style="list-style-type: none">• Brachycephaly• Delayed cranial suture closure• Frontal bossing• Small, wide nasal bridge• Skeletal class II malocclusion• Lacrima gland obstruction• Mouth breathing	<ul style="list-style-type: none">• Microdontia of permanent teeth• Hypodontia/Oligodontia• Macroglossia of the tongue• Fissured tongue• Tongue Thrust• Open bite• Generalized periodontal disease• increased incident of dental caries• Shovel Shaped incisors	<ul style="list-style-type: none">• Delayed speech• Impaired motor response• Loss of muscular tone• Altered immunological response• Hearing Impairment



Dental Caries

Studies show that children and teens with Down syndrome display a decrease in dental caries prevalence due to an increase in salivary IgA protein, also pointing to microdontia and presence of general diastemas as contributing factors to the reduction of caries incidence. Other studies contradict these findings, and attribute the increased incidence of dental caries on the environmental factors, as well as physical and behavioral impairment that is typically found in people exhibiting DS.

Da silva et al (2020) report about published studies that link the loss of muscular tone and dental abnormalities of these individuals to them favoring a soft and liquid diet, pointing to the difficulty in chewing and the inability of eating harder foods. The main drawback of said diet being that it facilitates plaque accumulation and more caries progression.





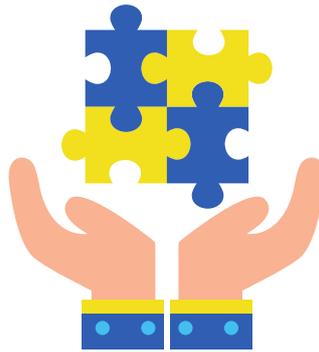
Periodontal Disease

Van de Wiel et al (2017) report that severe periodontal attachment was observed in people with Down syndrome, which was also directly correlated with age. While the craniofacial features attributed to DS have demonstrated a direct relation to periodontal disease, age and altered immunity response have displayed a stronger level of correlation than other factors.



Congenital Missing Permanent Teeth

Permanent tooth agenesis causes the congenital absence of one or more permanent teeth. This condition presents itself in approximately ~ 54.6%-58.5% of the population presenting with Down syndrome. The number of missing teeth varies; the most common teeth missing being maxillary lateral incisors, followed by mandibular 2nd premolars then finally by maxillary 2nd premolars.



Dental management of Patients with Down syndrome

Dental treatment needs to start at a young age, in order to reduce the manifestations of dental caries and periodontal disease.

Patients need to be acclimated to new environments like the dental clinic; scheduling regular check-up appointments can be of great help in the process.

It is important to seek dental professionals specialized in treatment of special needs cases or Special needs dental clinics.

Cognitive behavioral therapy (CBT) may be required for patients that have questionable levels of cooperation.

Good oral hygiene can reduce the severity and rapid progression of periodontal disease and caries.

Customized oral hygiene regiments should be provided for said patients, as well as caregivers, in order to decrease any disease progression and reduce the risk of dental infections.

The sources have been listed in the appendix.



My Role as a Member of The Community



Sarra Mkadmi

Down syndrome is the most common genetic chromosomal disorder, with a prevalence of about 1 in every 1000 persons globally. It is more likely than not that you yourself have stumbled upon a person with Down syndrome, or even know one in your personal life. As a community, it is our role to understand this group of people of determination, and communicate with them efficiently, so that they feel more included and involved, and remove any potential stigma that may be present within our society. Here are some simple, yet crucial key points in how to deal with people with Down syndrome, either in a workforce or at home.

Address them correctly!

Having the syndrome doesn't define who they are as individuals. Avoid calling them as Down's, or Down Syndrome people. They are more than just a diagnosis.

Be patient.

When speaking to them, give them time to process what you are saying. Slow down when you are talking and give them up to 10 seconds for them to comprehend the conversation. It takes time, but its definitely worthwhile.

Be a Motivator!

Showing a positive mindset and approach doesn't apply only to them, but to anyone! Always be kind and set positive expectations to them when handled a task or an assignment. Positive reinforcers and encouraging words are the way to go.

Give Clear Instructions.

It is difficult for them to follow multiple directions simultaneously. Give them one task at a time, and preferably show instead of tell them how to perform the task. Using visual aids is a great reinforcer to them.

Be inclusive.

Involve them in group activities and discussions. Create a safe space for them to feel included as actual members of the friend group or workforce.

Source: DSG Down Syndrome Guide of Greater Kansas City



Myth VS Fact



Ala'a Al Hajji

We receive enormous information everyday, some of which are myths. When it comes to diseases, we should know what's true and what's not. This is your opportunity to look at some myths vs facts!



people with down syndrome can't learn new concepts and skills

people with down syndrome don't have emotions and they are always happy

People with down syndrome are unable to marry and give birth to children

People with down syndrome don't live long

People with down syndrome are unable to work and improve themselves in a specific career



people with down syndrome can learn new things, study, and memorize but they might take longer time to perform tasks.

People with down syndrome have normal feelings just like any other person. They can feel both happiness and excitement as well as sadness

People with down syndrome have the ability to form ongoing relationships and families

The average life expectancy of people with DS is almost equal to that of people without down syndrome

People with down syndrome can be very professional and creative in many fields; they seek a considerable number of positions in the working field





Under the Spotlight

RARE AND ATYPICAL DISORDERS



Khadijah O. Zaidan

Angelman Syndrome:

In 1965, Harry Angelman, an English general pediatrician, reported three children with a similar pattern of intellectual disability, seizures, ataxia, easily provoked laughter, absent speech, and dysmorphic facial features.' He named them 'the puppet children'. Later, this name has changed into 'happy puppet syndrome' and this term continued in popular use for many years. However, nowadays it is referred to as Angelman syndrome, and its prevalence is estimated to be approximately 1 in 12,000-20,000 people in the general population, however, the risk of having an infant with Angelman syndrome might increase if there is a case in the family.

The etiology behind the Angelman syndrome is the loss or reduction of the ubiquitin-protein ligase E3A enzyme, which means that there is an abnormality of the gene that is responsible for the transcription and translation of this enzyme. However, to this day, we know four genotypic mechanisms that confer the Angelman syndrome phenotype, microdeletion or mutation of the maternal UBE3A gene, paternal uniparental disomy, or an imprinting defect.

Although many patients with AS have these characteristics, that Sir Angelman has described, it is now clear that the clinical spectrum of Angelman syndrome is much broader than was originally thought. However, these features could and could not be found in an individual with AS.



International
Angelman Day



Physical features

- The dysmorphic facial features are not apparent at birth but evolve during infancy and childhood.
- Typical features include brachycephaly (flat head) and a smaller head circumference (> the 25th centile).
- The facial features are subtle and include a wide, smiling mouth, prominent chin, midfacial hypoplasia, and deep-set eyes.
- Hypopigmentation of the skin, hair, and eyes compared to other family members is seen in the majority but not all AS

Neurological Manifestations

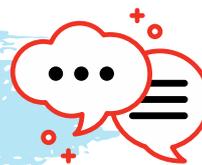
- Epilepsy is common and may present with multiple seizure types, including nonconvulsive status epilepticus
- Abnormal ECG patterns.
- Movement disorders are nearly universal in AS, most frequently presenting with ataxia and tremor.
- Neurocognitive impairment is always present to varying degrees.

Behavioral characteristics

- The behavioral features seen in AS are perhaps the most consistent clinical feature
 - Sudden attacks of easily provoked laughter begin within the first few weeks of life and almost all patients are happy and smile frequently.
 - Sleep disorders are also common, often characterized by abnormal sleep-wake cycles.
 - Expressive speech is typically severely affected.
 - Individuals with Angelman syndrome often manifest psychiatric comorbidities including hyperactivity, anxiety, and challenging behaviors such as aggression and self-injury.



Foreign Accent Syndrome



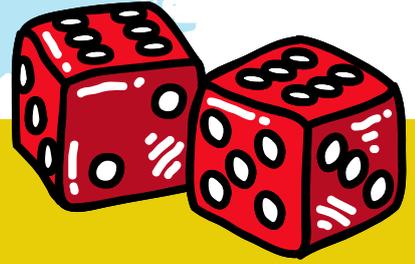
Sarah Colwill, an English lady was hospitalized for a severe headache back in 2010, on the way home, she noticed that she has a different accent, Chinese. Later, she discovered that it was a condition called foreign accent syndrome. FAS is a speech disorder that causes the native speaker to have a sudden change in speech and is perceived to speak with a "foreign" accent. this condition could be caused by brain damage caused by trauma or stroke. Other causes could be multiple sclerosis and conversion disorder. In some cases, no obvious reason why it has happened. The individuals with FAS might have altered speech in terms of the pronunciation of the letters, but the speech remains in the same language, and highly intelligible.

Watch this: <https://www.youtube.com/watch?v=ZCYGI0LvQws>



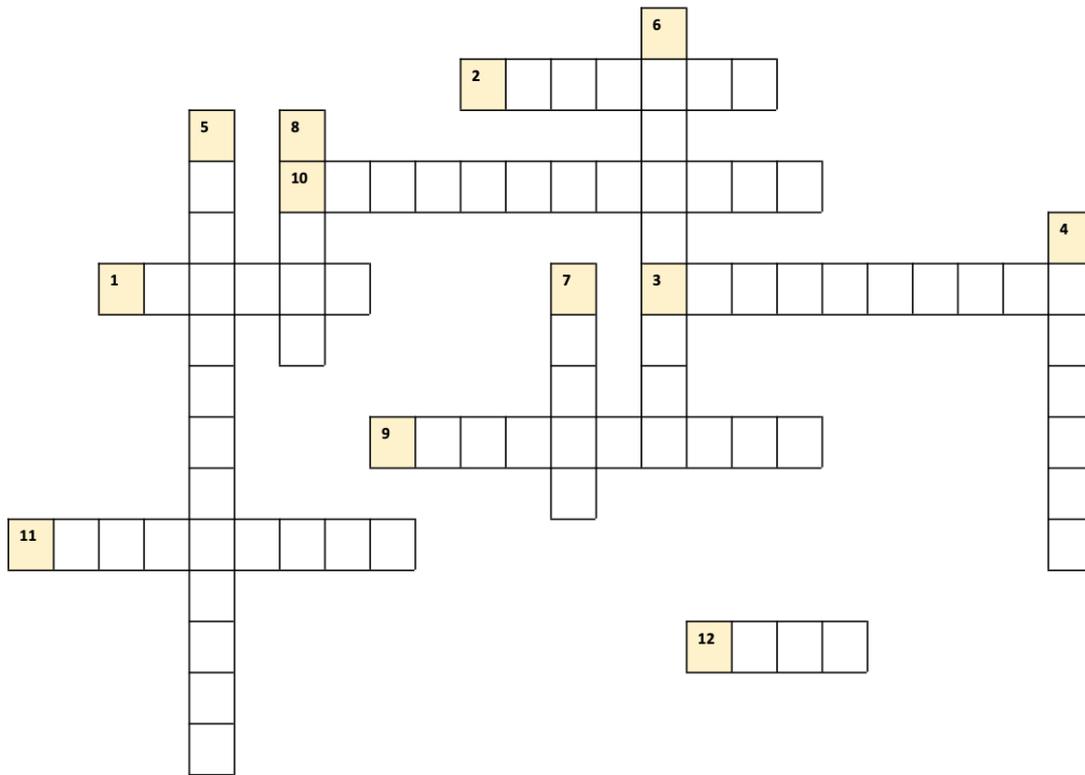


The Arcade



Hajir Saeed Kheder

Want to test your crossword skills? Below are statements regarding down syndrome, complete the blanks then write the letters in the puzzle horizontally or vertically according to the numbers shown.



horizontal

1. Down syndrome is a ----- disorder.
2. One type of Down syndrome is known as ----- 21.
3. Which is an extra 21 -----.
9. A common brain disease that can affect people with down syndrome is ----- disease.
10. Most people with down syndrome live -----.
11. People with down syndrome are capable learners, thus should be provided with proper -----.
12. Everyone, including people with down syndrome are deserving of -----.

Vertical

4. the disorder happens during the cell replication phase called -----.
5. another type of down syndrome is called -----, which is when an extra 21 chromosome is attached to chromosome 14
6. Least common type of down syndrome is known as -----.
7. The ----- the mother is, the greater the chance of having a child with down syndrome.
8. The average life expectancy is ----- years.

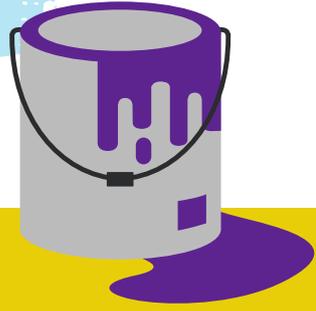
The answer key is provided in the appendix..



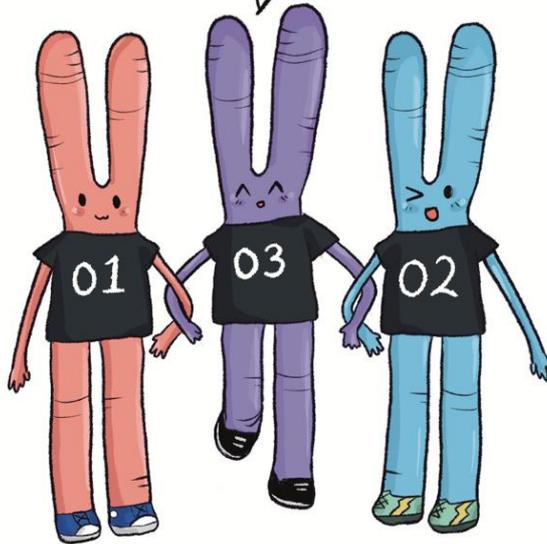
Caricature Corner

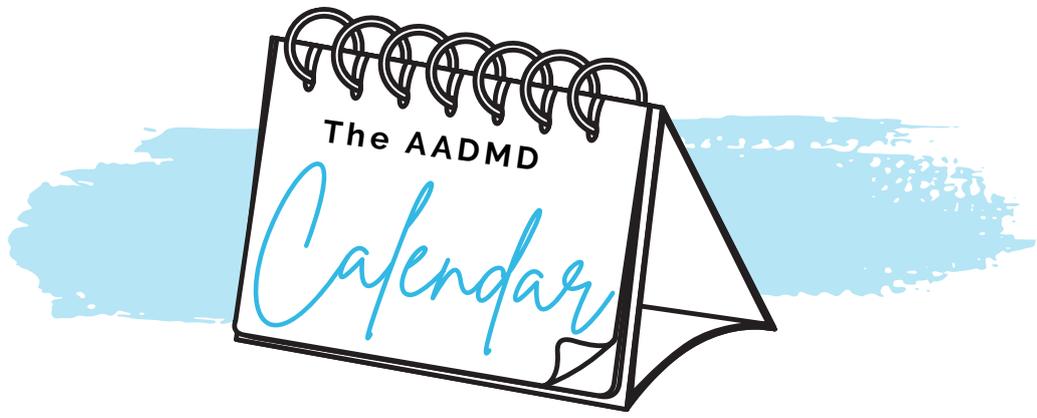


Hajir Saeed Kheder



Hello!
is there room for me?

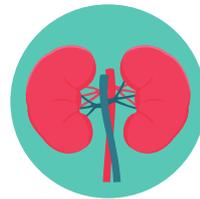




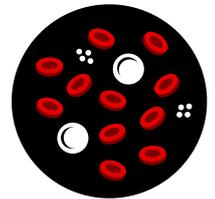
Hajir Saeed Kheder



Colorectal cancer awareness month



Kidney cancer awareness month



Multiple myeloma awareness month

1	2	3	4	5	6	7
Zero Discrimination Day		world hearing day				
8	9	10	11	12	13	14
women's day				world kidney day*		
15	16	17	18	19	20	21
						world down syndrome day
22	23	24	25	26	27	28
		world TB day				
29	30	31				



Appendix

Medical Research:

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The Arcade answer key:

1. Genetic
2. trisomy
3. chromosome
4. meiosis
5. translocation
6. mosaicism
7. older
8. sixty
9. Alzheimers
10. independently
11. education
12. love