# C43 Special Imaging Considerations for Autistic Patients

Standford. (2024, January 1). Autism. Disability Staff Forum. https://dsf.stanford.edu/autism-0

## **Objectives**

- ♦ Define Autism Spectrum Disorder (ASD).
- Explain how caretakers of autistic patients feel about exams.
- ♦ Describe how imaging may affect those with ASD.
- ♦ List potential strategies for imaging autistic patients.



EPA. (2023, May 5). Radiation and Medical X-rays. https://www.epa.gov/radtown/radiation-and-medical-x-rays

### What is Autism Spectrum Disorder (ASD)?



#### ♦ Autism Spectrum Disorder is a disorder characterized by attributes such as...

- ♦ Sensory Issues: Inability to filter out sensory stimuli.
- ♦ Social Awkwardness / Speech Issues: May not understand social interactions or cues and have hard time communicating.
- *♦ Physical/Motor Skill Issues: Object Permanence and muscle memory issues are common.*
- ♦ Poor Mental Health: Very common, and often the reason autistic people can have a short life expectancy.
- $\diamond$  ASD is passed on via genetics.
- ♦ Autism is a spectrum disorder...
  - There are varying degrees of severity from mild to severe. Even then, two mild autistic people could be entirely different in terms of their levels of ability making treatment based on the individuals more difficult.
- ♦ There is no cure, only treatments for managing it.
  - ♦ Occupational/Physical/Speech/Mental Health Therapies.
  - ♦ Medications for managing specific symptoms.
- ♦ It usually is diagnosed in childhood (though individuals can go undiagnosed) and is a lifelong disorder.
- ♦ It now encompasses a variety of other neurodevelopmental disorders like the ones in the image to the right...



LancUK. (2016, January 1). Autistic spectrum disorder. Lanc UK. https://www.lanc.org.uk/related-conditions/autistic-spectrum-difficulties-asd-adhd/

# Signs and Symptoms of ASD



The signs and symptoms of ASD can be summarized into three categories, social communication, social interaction, and social imagination difficulties. Below are examples of each of these categories. These symptoms get better as autistic people age but do not completely go away or may even get worse depending on their upbringing.

### Social Communication Difficulties:

- ♦ Understanding verbal/non-verbal language.
- ♦ Taking things very literally.
- ♦ Understanding jokes or sarcasm.
- ♦ Taking turns in a conversation.
- Only wanting to talk about their own interests.

### Social Interaction Difficulties:

- > Recognizing emotions or feelings.
- ♦ Expressing their own emotions.
- ♦ Appearing insensitive, yet quite the opposite.
- ♦ Preferring to spend time by themselves.
- Appearing to behave inappropriately, but do not know better.

#### Social Imagination Difficulties:

- ♦ Unable to recognize emotions or feelings of others.
- ♦ Trouble understanding people's feelings.
- Inability to think ahead and predict what might happen.
- ♦ Understanding the concept of danger.
- ♦ Find it difficult to engage in imaginative play or role playing.
- ♦ Disliking new/unfamiliar situations.
- ♦ Inability to respond well to change.

# Sensory Overload

- Sensory Overload: The inability to filter out sensory signals from your surroundings in time and results in an autistic person's brain being completely overwhelmed with stimuli. Can either be strong or weak stimuli (potent perfume, loud noises, etc.).
  - *♦ Very similar to a computer crashing.* 
    - ♦ Too much data + processing all at once = Computer crashing/Brain overwhelmed.
  - Can be crippling to both autistic children and adults though adults may have better control over it.
     Depending on their upbringing.
  - ♦ *Can cause stress, anxiety, or even physical pain.*
  - ♦ Can even be caused by enclosed tight spaces (such as MRI or CT scanners).
  - \* Even things such as contrast and ultrasound gel can set ff sensory overload if their brain doesn't like what it is feeling.
- ♦ Can be the result of anything your body can sense via these senses...
  - *♦ Gustatory* / *Taste*.
  - *♦ Tactile / Touch.*
  - ♦ Olfactory / Smell.
  - ♦ Auditory / Hearing.
  - ♦ Visual/Sight.
  - *♦ Proprioception / Object Permanence / Lack of Bodily Awareness.*





Cheyette, B., & Cheyette, S. (2020, April 19). Making sense of sensory overload in autism and ADHD. Psychology Today. https://www.psychologytoday.com/ca/blog/1-2-3-adhd/202004/making-sense-sensory-overload-in-autism-and-adhd

# Sensory Overload Continued

- ♦ What are some signs someone is experiencing sensory overload?
  - Restlessness/Extreme discomfort:
    - ♦ Usually social, they may look annoyed or scared.
  - **♦** Stimming:
    - Drumming fingers, tapping leg up and down, etc. are all strategies to help autistic people calm down, also not effective if stimuli is still active. Stimming can also be happy and positive, especially when they get excited about something.
  - ♦ Fatigue:
    - *♦ Can be tired or exhausted socially, mentally, and physically.*
  - ♦ Extreme Irritability:
    - *This comes from confusion of not understanding why this is happening to them or even why.*
  - ♦ Blocking it all out:
    - ♦ *Trying to cover ears and eyes to avoid more stimuli coming in.*
  - ♦ PANIC!!!:
    - \* The strong urge to escape overwhelming stimuli. Triggered by fight or flight response.



# Why Is All This Important?



- ♦ The ever-growing population of people who have a form of ASD demands the utmost understanding and care like everyone else. It's especially important if these people struggle to do things everyone else tends to take for granted.
- ♦ Below are some statistics from the CDC regarding autism from 2020.
  - ♦ 1 in 36 children have some form of ASD. That's 2.77% of all children.
  - *♦ ASD* occurs in all races, gender, ethnic, and socioeconomical groups the world over.
  - *♦ ASD is four times more common in males than females.*
  - *Children born in 2016 according to the same report were 1.6x more likely to develop ASD than children born in 2012.*
  - ♦ In the US, the number of adults who have ASD is estimated to be around 5,437,988 (2.21%).

# How Do Caretakers of Autistic Patients Feel About Current Exams?

- There was a study done regarding how the caretakers of autistic patients feel about current medical imaging exams.
- Caretakers can be anyone form their parents, to other medical professionals, to other family members or legal guardians.
- In this study they found that most Radiographers and even healthcare professionals in general do not have the confidence, training, or skills necessary to accommodate the basic needs of autistic individuals.
- The images to the right and on the next slide are graphs and diagrams from this article that represent the experience of caretakers of autistic patients in the Radiology department.

#### sults was clearly explained in a way... hat my child might be frightened or...

**Responses to Likert Statements** 

The process of how and when to get the results was clearly explained in a way. I thought the radiographer understood what my child might be frightened or. I felt that the radiographer was flexible and changed their approach to the X-. I was asked by the radiographer how it was best to communicate with my child I was fully involved in the examination

We were given enough time for my child to get used to their new environment The radiographer was able to explain the X-ray examination to my child in a. It was clear that the X-ray room had been prepared, taking my child's needs. The radiographer formed a good rapport with my child, helping them to feel. My child was given a choice about changing for the examination and this was. The radiographer clearly had an understanding of children with autism I felt that the radiographer made an effort to greet my child in the right way The staff seemed to understand why my child would need to be seen quickly The waiting area was a comfortable place for my child to wait for their X-ray. I had to explain my child's specific needs to ensure that they looked after us. It was clear that the reception staff were aware of my child's specific needs in.

I felt we were greeted in an appropriate way on arrival by the reception staff







#### Strongly Agree Agree Disagree Strongly Disagree N/A



Harvey-Lloyd, J. M., Clements, A., Sims, N., & Harvey-Lloyd, A. E. (2023, October 30). Exploring the experiences of parents of autistic children when attending the Diagnostic Imaging Department for an X-ray examination. Journal of Medical Imaging and Radiation Sciences. https://www.sciencedirect.com/science/article/pii/S1078817423001815#fig1

## How Do Caretakers of Autistic Patients Feel About Current Exams? Continued



# How Can Imaging Potentially Affect Those Who Have ASD?



- ♦ The communication issues ASD patients have may make it hard to convey instructions.
- The sensory issues ASD patients face may pose a challenge to getting diagnostic images, especially if the noise of the machine, the smell of the disinfectant/cleaning supplies, or the brightness of the room may trigger sensory overload.
- ♦ The environment of the healthcare facility prior to them coming into any imaging room may not have been ideal, and they may be high strung already.
- ♦ The lack of understanding or being insensitive to the needs of these patients as a healthcare professional could make things far worse for both the patient, and everyone involved.

# What Can Radiographers Do?



- Based on the research in Swedish healthcare settings as well as how current parents, guardians, and caretakers
  of autistic patients feel about coming into the imaging department, there are a few things Radiographers can
  do prior to an exam as well as during and after.
- The important thing to consider is that Radiographers still must perform the exam safely and correctly to achieve diagnostic images, but doing what is reasonably able to be done helps make the experience for those with ASD more manageable.
- ♦ Below are a list of steps, compiled together from two database scientific articles and cross-referenced with the information from the previous slides regarding how Autism works to attempt to make things easier for autistic patients and their caretakers.
  - *♦ Step 1: Talking Strategy*
  - ♦ Step 2: Prepping the Room Before They Come In
  - *♦ Step 3: Adapt to the Current Situation While Performing Exam*
  - *Step 4: Ending the Exam and Self-Assessment*
- ♦ After explaining these steps in detail, there will be a brief scenario using these steps that demonstrates how to administer an abdominal x-ray exam to an autistic patient who is inseparable from her mother.

# Step 1: Talking Strategy

- ♦ The first thing is discussing with the patient or their caretaker about what the procedure involves, trying to figure out what sensory triggers may interfere with the procedure, and how the radiographer may propose to get around them.
- Making sure the patient and their caretaker feel satisfied with the trip by making the whole process simple, clam, welcoming, and not sensory-overload-inducing is vital to the wellbeing of everyone involved, including the Radiographer.

#### **♦ ALWAYS TALK DIRECTLY TO PATIENT IF ABLE!!!**

- One of the findings from the caretaker and Swiss studies was that the caretakers want more direct communication between the Radiographer and their autistic child/adult, as well as better interdepartmental communication letting Radiographers know what the patient may need.
- ♦ The other thing is figuring out how to communicate with the patient. Here's some suggestions below for how to potentially talk to an autistic patient.
  - *♦ <u>Being super specific:</u> Because they are literal, more specificity is key.*
  - *Solution States and S*
  - Not looking them in the eyes: It may seem rude, but for an autistic person direct eye contact is very uncomfortable. Looking just off to the side, but still in their direction helps a lot.
  - <u>Using a calm voice:</u> being calm and collected at all times reduces the chance of a sensory overload going into a meltdown.



RadInfo for Kids. (2024, January 1). For kids. Radiologyinfo.org. https://www.radiologyinfo.org/en/for-kids



# **Step 2: Prepping the Room Before They Come In**



- ♦ After doing an initial assessment of the patient and making sure you've identified any sensory "triggers", it's time to ready the room for the patient.
- Make sure you don't compromise the exam! Its important to cater to the patients needs to the best of your
   ability, however, you still need to get diagnostic images. Make sure all accommodations do not interfere with
   diagnostic quality.
- ♦ Prepping the room for the patient could include any of the following...
  - ♦ Music via headset to drown out the noise.
  - *Prepping small clogging devices like gauze or tissues to plug their noses (helps disguise strong cleaning chemical smells).*
  - ♦ Lowering or increasing the light in the room (some may be afraid of too much darkness).
  - ♦ Making sure that sandbags can be used (if needed)
  - \* Making sure lead aprons are in the room (if needed by either the staff or caretakers to help comfort or hold the patient)

# **Step 3: Adapt to the Current Situation While Performing Exam**



- \* This is the step most Radiographer's do very well with according to both the caretaker and Swiss study.
- ♦ Its important that no matter what modality you are apart of, that the exam constantly adjusts to the patients needs.
- ♦ If you feel like in their current condition that they cannot go through with the remainder of the exam, do not force it.
  - According to the Swiss study, autistic patients tended to negatively respond to or outright refuse future exams within the same department over being forced to do something against their will.
- The patient may want to bring in toys or stuffed animals with them into the exam, its important that parents and Radiographer's know this ahead of time that way they can still have it with them during the exam without it interfering with it.
  - *Moving the toy or stuffed animal between both hands depending on what you are looking at may be an easy way to solve this.*
- ♦ If the patient needs to be held or restrained, it may be helpful to have their caretaker don protection if able (lead apron, thyroid collars, etc.) so that they can stay out there with them.
  - This will also help communicate with the patient if they are non-verbal as the caretaker may understand how to tell them what the radiographer needs of them.
  - *This also can eliminate motion from unwanted stimming for a brief moment while taking the images.*

# <u>Step 4: Ending the Exam and</u> <u>Self-Assessment</u>



- After the exam is done, tall the patient they did an awesome job and reward them with candy or stickers if
   they are kids. All kids love candy and stickers, especially autistic ones. Maybe even some adults want a sticker
   or candy depending on their mental state and if the caretaker thinks it's a good idea.
- ♦ After the exam is complete, it is important to take a moment and reflect.
  - *♦ What could have been done better?*
  - *The Was everything needed to complete the exam in a more efficient way in the room ahead of time?*
  - ♦ What was done well?
  - *♦ Did the patient seem more comfortable doing one exam vs another?*
  - *♦ Compare to other exams with autistic patients.* 
    - *♦ How has the approach changed?*
    - *The What was different about one patient compared to another?*

# Scenario:



- ♦ The scenario is as follows...
  - ♦ A pediatric patient comes into the ER of a facility, her mother is with her and is constantly attached to her mother's leg.
  - ♦ The patient is 7 years old, and non-verbal.
  - \* Primary complaint is hematuria and extreme pain when trying to use the restroom.
  - \* The mother mentions to the front desk in the ER that the patient is autistic and may lash out if they are separated.
  - \* The physician attending to the patient orders a KUB for the Radiographer in x-ray to perform.



- The Radiographer comes back into the ER to grab the patient, noticing the patient appears terrified and is stimming, tapping her left knee up and down while sitting in her mother's lap.
- The Radiographer greets the patient and her mother and begins to take a history from the mother. The patient doesn't look or respond to the Radiographer's questions or greetings.
- During the history, the patient's mother reiterates that the patient is autistic, ۲ and currently overwhelmed with everything going on with her.
- The mother then asks if there's anyway for her to be next to her daughter  $\otimes$ during the exam, and fully accepts the risks as stated by the Radiographer.
- The Radiographer decides to give her a lead apron and thyroid collar and will instruct her on what to do during the exam as the mother seems to be a very comforting figure right now for the patient.
- The Radiographer asks if there are any sensory issues the patient may have and discovers that strong potent smells and bright lights can affect the patient.
- The Radiographer then explains the procedure and takes them back into the  $\otimes$ radiology department where the x-ray will be performed.



Dosimetry. Radiation badges: Understanding the importance of personal dosimetry. https://www.landauer.com/blog/radiation-badges-understanding-importance-personaldosimetry



- The Radiographer comes into the radiology department with the patient and her mother. They approach the room where they will be performing the procedure, and the Radiographer asks that they come inside the room so the radiographer can see if the patient can smell the cleaning chemicals that they use.
- ♦ The mother asks the patent when they step inside is she can smell anything, and the patient begins to freak out covering her nose.
- ♦ They all step outside the room while the radiographer asks them to wait there and goes to grab some small gauze.
- The Radiographer comes back and asks the mother to assist in plugging the patient's nostrils so that she doesn't smell the chemicals. The mother obliges and does so slowly, constantly making sure the gauze will not send her daughter into sensory overload due to the texture of it and the sensitivity of the patient's nose.
- ♦ They manage to get the gauze in the patient's nostrils without upsetting the patient further. They get the patient in the room and lying flat on the x-ray table for a KUB.
- ♦ The Radiographer shows the mother how to put on the lead apron and thyroid collar and suggests that she relay the information to the non-verbal patient while they are behind the wall.
- \* The Radiographer then turns off the lights in the room and closes the door to minimize the light for the patient's light sensitivity. The patient becomes immediately calmer speaking for the first time thanking the Radiographer.
- ♦ The Radiographer then talks directly to the patient as they line up the bucky and light field, making sure to not bring the light over her face asking about what she likes to do for fun.



Jaremko, J. (2023, August 9). Pediatric X-ray: Diagnostic Imaging in Edmonton. MIC Medical Imaging. https://www.mic.ca/for-patients/procedureinformation/pediatric-imaging/pediatric-x-ray



- The Radiographer continues talking with the patient while doing their final checks. Their department protocol for a KUB requires diaphragm to pubic symphysis and the Radiographer believes they can get it all in one picture due to the patient's small and skinny stature.
- The Radiographer then instructs the mother to stay out of the light field and as far away from it as possible. The Radiographer then is ready to take the picture and for radiation protection reasons, talks again with the mother and patient, telling them both its still way safer for mom to come back with him for a brief second while they take the picture. The Radiographer offers a sucker candy from behind the wall and a few stickers if she lets her mom come back with him. The patient perks up and agrees by nodding her head, a huge smile upon her face.
- ♦ The Radiographer takes the picture at the last second after telling her to hold her breath out as she stims happily, completely comfortable and excited. The image comes out blurry and has to be re-done.
- ♦ The Radiographer then asks the patient to try and hold still but she's to excited. The Radiographer then asks if the mother can go out there and try to help make sure her daughter remains still. The Radiographer says the patient will get the sucker and stickers if she stays still.
- ♦ The patient, with the help of her mother, says still for the entire procedure. After the picture is done, the mother and Radiographer congratulate the patient as the patient receives her well–earned sucker and sticker.







- The Radiographer escorts the patient and mother back to the ER, continuing to ask the patient about what she likes doing and what she's gonna do when they get done with their visit.
- The Radiographer then says their goodbyes to them and vice versa wishing them a good day.
- ♦ The Radiographer on the way back thinks about what they could have done better, what went well, and how does this exam compare to other exams like it....
  - They notice that the repeat could have been avoided if they had talked about the candy ahead of time and paid more attention to the happy stimming.
  - They also noticed that they maybe should have suggested to the mother earlier that trying to stay behind the wall at first would have been a better idea but it's not really of consequence as they had realized that the lead apron and thyroid collar were to be an if needed thing.
  - \* They realized their communication with the autistic patient and her mother was good though he mainly talked via her mother due to the non-verbal nature of the patient at first.
  - ♦ They realized they also did really well managing the needs of the patient when prepping the room prior to the procedure. The gauze could have irritated the patient sensory-wise, but the strategy worked for that patient.
  - They compared this back to other exams they had done on similar patients and realized that this was their best one so far. In prior exams, they had failed to manage the immediate needs of the patient completely despite helping best they could. The Radiographer has learned a lot from their previous encounters with autistic patients and is getting better with every attempt.



Bickle, I. (2022, November 24). Normal abdominal radiograph - pediatric Radiology case. Radiopaedia. https://radiopaedia.org/cases/normalabdominal-radiograph-paediatric



# In Conclusion

- Autism Spectrum disorder is a genetic disorder characterized by lack of social understanding and sensory issues.
- Because Autism is on a spectrum, not every patient is the same and it is very important to consider this as well as their sensory and social issues when performing an exam.
- Due to the rise in Autistic patients and the difficulties they face, it is important as healthcare providers ۲ to see to their needs in a way that allows Radiographers to get the diagnostic images they need without compromising too much patient comfort.
- Based on two different studies, there are many areas of improvement in which Radiographers can make the experience of Autistic patients more comfortable.
- All these areas for improvement have been compiled into four steps, which include the following...
  - Talking strategy with the patient and/or their caregiver ahead of time about what is being imaged and how its ۲ going to work, as well at finding a good communication method to talk with the patient.
  - Prepping the room for the procedure with any autistic issues in mind.  $\otimes$
  - When performing the procedure, adapting to the patients needs in the moment. If the procedure needs to be done ۲ another day due to the patient being overwhelmed, then that is an option that must be considered.
  - Ending the exam and making a self assessment of how you did, and comparing how this exam went compared ٢ to others like it. Also gaining confidence for dealing with patients on the spectrum of Autism is important to evaluate after every exam with an autistic patient.
- These four steps, played out over a scenario, were arranged in a way to show how a Radiographer  $\otimes$ might go about an exam with some minor tweaks to account for the potential needs of autistic patients.

Miller-Hoover, S. (2018, July 25). Radiologic Technologists. Radiologic Technologists | RN.com. https://www.rn.com/blog/headlines-in-

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