Tardive Dyskinesia:
Assessment Using the Abnormal Involuntary
Movement Scale (AIMS)



[Presenters' names (Field Medical personnel) and Contact Info]

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DRBA-Induced Movement Disorders

- Dopamine Receptor Blocking Agent (DRBA)-induced movement disorders are associated with medications commonly used to manage psychiatric disorders, such as antipsychotics^{1,2}
- Extrapyramidal Symptoms (EPS) is an obsolete umbrella term that has been used to describe a collection of DRBA-induced movement disorders despite each having a distinct pathophysiology, presentation, and treatment³
- Tardive dyskinesia (TD) is an often persistent, clinically distinct DRBA-induced movement disorder^{2,4}
 - Can coexist with other DRBA-induced movement disorders⁴
 - Requires specific management⁴
- Understanding the differences between TD and other DRBA-induced movement disorders will aid in optimizing patients' treatment plans

^{1.} Fahn S. Principles and Practice of Movement Disorders. 2nd ed. Elsevier Health Sciences; 2011. 2. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition. American Psychiatric Association: Washington, DC; 2013. 3. Greenbaum L, et al. Front Neurol. 2015;6:27. 4. Van Harten PN, et al. Schizophr Res. 1997;26:235-242

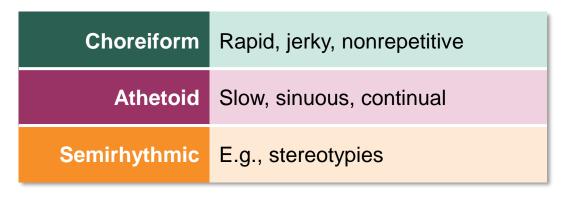
Tardive Dyskinesia (TD) is Associated with Prolonged Exposure to Dopamine **Receptor Blocking Agents (DRBAs)**



Tardive Dyskinesia

Defined as abnormal, involuntary movements of the tongue, jaw, trunk, or extremities that develop in association with medications that block post-synaptic dopamine receptors

TD movements may be:*



DRBAs can include:

- First-generation antipsychotics
- Second-generation antipsychotics
- Gastrointestinal medications, such as metoclopramide









^{*}Movements are distinctly different from the rhythmic tremors (3-6 Hz) commonly seen in drug-induced parkinsonism1 DRBA, dopamine receptor-blocking agent; TD, tardive dyskinesia; OBL, oral-buccal-lingual.



Diagnosis of TD

- Healthcare providers use clinical evaluation and medical history to diagnose TD
- TD may appear in patients also experiencing other DRBA-induced movement disorders



^{*}Dyskinesia may remit with continued withdrawal. A diagnosis of TD may be warranted if the dyskinesia persists for at least 4 weeks. DRBA, dopamine receptor-blocking agent; TD, tardive dyskinesia; LAI, long acting injectable.







Screen All Patients Taking Antipsychotics at Each Visit

TD assessments should include regular clinical assessments and periodic assessments using a structured instrument (e.g., AIMS)^{1,2}

Clinical Assessments^{1,2}



Structured Assessments¹



All patients

Higher risk for TD

Lower risk for TD

Baseline

Every 6 months

Every 12 months

If new onset or exacerbation of movements is detected at any visit

AIMS, Abnormal Involuntary Movement Scale; DRBA, dopamine receptor blocking agent; TD, tardive dyskinesia.

^{1.} American Psychiatric Association. The American Psychiatric Association. The American Psychiatric Association Practice Guidelines for the Treatment of Patients with Schizophrenia. American Psychiatric Association; 2021. 2. Caroff SN, et al. J Clin Psychiatry. 2020;81(2):19cs12983.

Scoring AIMS

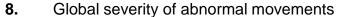


AIMS is a 12-item, clinician-rated scale used to assess TD severity

It is a screening instrument and is not diagnostic

	Facial and Oral Movements	None	Minimal	Mild	Moderate	Severe
1.	Muscles of facial expression	0	1	2	3	4
2.	Lips and perioral area	0	1	2	3	4
3.	Jaw	0	1	2	3	4
4.	Tongue	0	1	2	3	4
	Extremity Movements	None	Minimal	Mild	Moderate	Severe
5.	Upper (arms, wrists, hands, fingers)	0	1	2	3	4
6.	Lower (legs, knees, ankles, toes)	0	1	2	3	4
	Trunk Movements	None	Minimal	Mild	Moderate	Severe
7.	Neck, shoulders, hips	0	1	2	3	4





9. Incapacitation **Awareness**

11-12. Dental Status



0=no dyskinesia; 1=low amplitude, present during some but not most of the exam; 2=low amplitude and present during most of the exam (or moderate amplitude and present during some but not most of the exam); 3=moderate amplitude and present during most of exam; or 4=maximal amplitude and present during most of exam. AIMS, Abnormal Involuntary Movement Scale; TD, tardive dyskinesia.

Guy W. ECDEU Assessment Manual for Psychopharmacology: Revised (DHEW publication number ADM 76-338). National Institute of Mental Health, Psychopharmacology Research Branch; 1976:534-537.



AIMS Scoring Anchors

The descriptors in the table below are unique to the valbenazine clinical trials in adults with TD and include a more detailed explanation of how each severity level (0 to 4) is scored. The additional details include the amplitude and frequency of symptoms, which may help providers assess and assign an appropriate score for each body region.

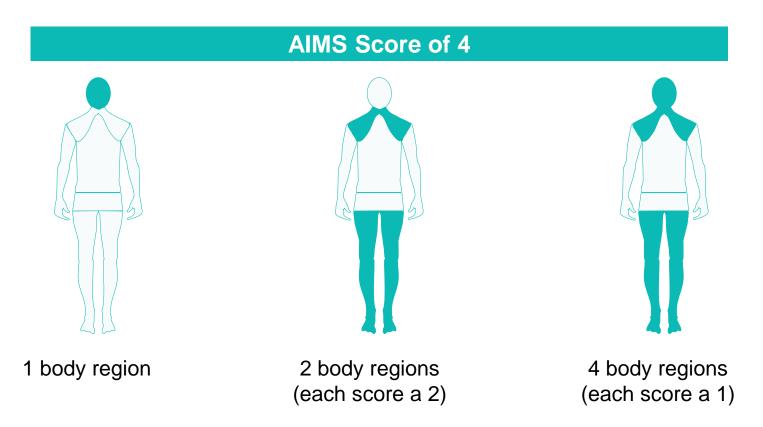
Score	Anchor
0	No dyskinesia
1	Minimal or slight dyskinesia: low amplitude, present during some but not most of the exam
2	Mild dyskinesia: low amplitude and present during most of the exam (or moderate amplitude and present during some of the exam)
3	Moderate dyskinesia: moderate amplitude and present during most of exam
4	Severe: maximal amplitude and present during most of exam

^{1.} INGREZZA [package insert]. San Diego, CA: Neurocrine Biosciences, Inc. 2. Guy W. Abnormal Involuntary Movement Scale. ECDEU Assessment Manual for Psychopharmacology. 1976:534-537.



Impact of AIMS Score on TD Presentation

- AIMS is not a linear scale
- Each total AIMS score can represent a range of clinical presentations with varying impact on each individual







Prior to the AIMS Exam

Prepare:

- 1. Examine the patient at rest to assess for movements in the waiting room and while walking to exam room.
- 2. Use a hard and firm chair that has no arms.
- 3. Ask patient to remove shoes and socks.
- 4. Be prepared to complete the entire exam before scoring it.

Begin:

- 1. Ask the patient if there is anything in their mouth? i.e., gum or candy
- 2. Ask about the condition of their teeth. Do they wear dentures? Do they bother them?
- 3. Ask if they notice any movements of mouth, tongue, hands, or feet.
 - If yes, ask them to describe the movements.
 - Ask if movements interfere with activities of daily living or bother them.



How to Conduct the AIMS Exam: Patient Posture

Instructions:

- Have the patient sit in the chair with legs slightly apart and feet flat on the floor
- Ask the patient to sit with their hands hanging unsupported either between their legs or hanging over their knees





How to Conduct the AIMS Exam: Mouth Open

Instructions:

- Ask the patient to hold their mouth open
 - Do this twice
 - Observe tongue at rest inside mouth





How to Conduct the AIMS Exam: Tongue Protruded

Instructions:

- Ask the patient to protrude their tongue
 - Do this twice
 - Observe for abnormal tongue movements





How to Conduct the AIMS Exam: Finger Activation Maneuver

Instructions:

- Activation maneuver: Ask the patient to tap their thumb to each finger as rapidly as possible for 15 seconds, one hand at a time
 - Observe for uncovered facial or extremity movements





How to Conduct the AIMS Exam: Arm Flex/Extension

Instructions:

- Flex and extend the patient's left and right arms, one at a time
 - Note any rigidity (sign of parkinsonism)





How to Conduct the AIMS Exam: Standing Arm Activation Maneuver

Instructions:

- Ask the patient to stand up
 - Observe the body in profile
- Activation maneuver: Ask the patient to extend both arms out in front, palms down
 - Observe trunk, legs, and mouth





How to Conduct the AIMS Exam: Walking Activation Maneuver

Instructions:

- Activation maneuver: Have the patient walk a few paces, turn and walk back to the chair
 - Observe hands and gait







AIMS Scoring: A Case Study



Patient History

- Age 41
- Schizophrenia
- Current medications
 - Sertraline 100mg (since 2010)
 - Amlodipine
 - Omeprazole
 - Atorvastatin



Item 1: Face (Forehead, Eyebrows, Periorbital Area, Cheeks)





Item 1: Face (Forehead, Eyebrows, Periorbital Area, Cheeks)





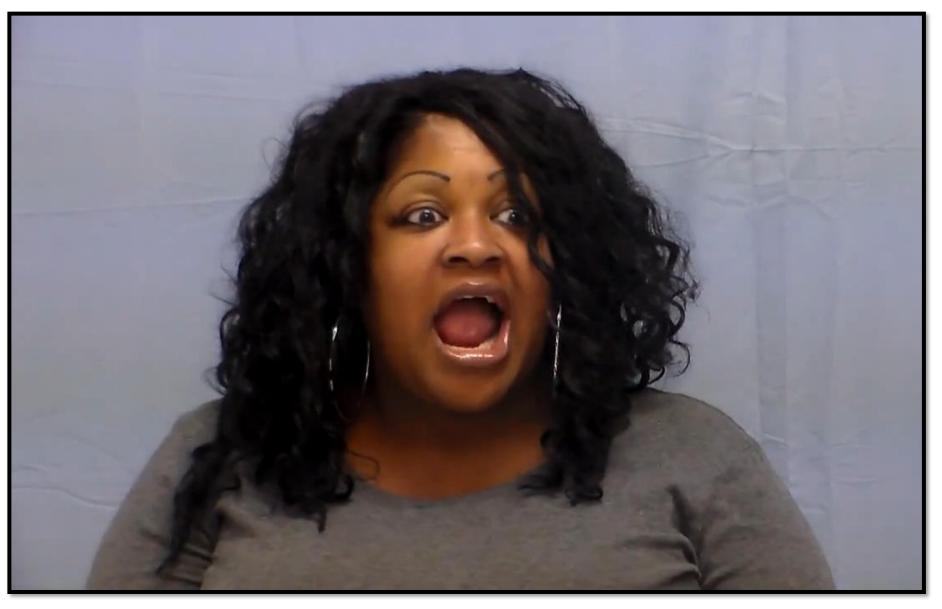
AIMS Item 1
Score^a: 1

^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.

Item 2: Lips/Perioral Area

Item 3: Jaw

Activation maneuver: patient asked to open mouth

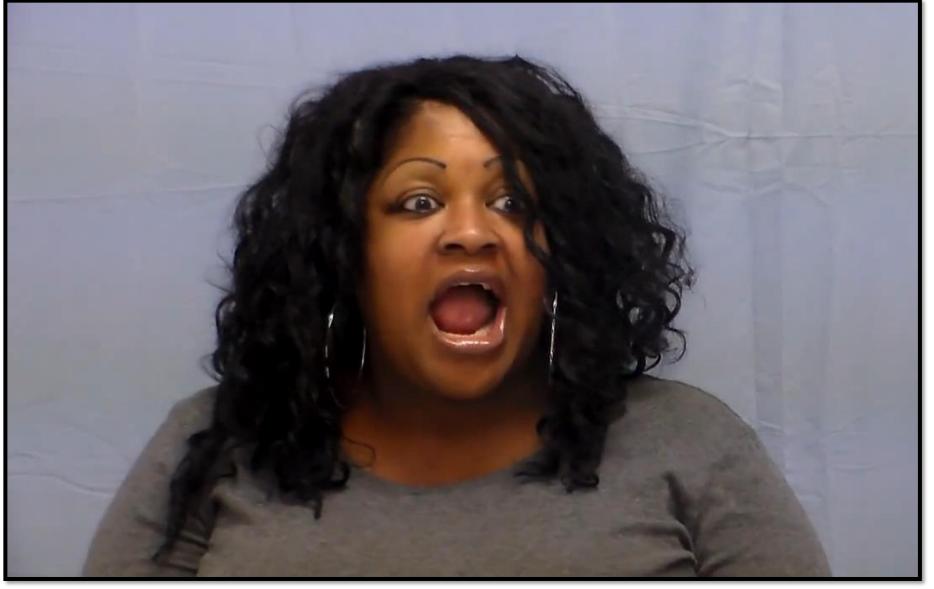


Item 2: Lips/Perioral Area

Item 3: Jaw

Activation maneuver: patient asked to open mouth

AIMS Item 2 Score^a: 1 AIMS Item 3 Score^a: 2



^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.

Item 4: Tongue



Activation maneuver: patient asked to stick out tongue



Item 4: Tongue



Activation maneuver: patient asked to stick out tongue

AIMS Item 4 Score^a: 1



^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.



Item 5: Upper Extremities (Arms, wrists, hands, fingers)





Item 5: Upper Extremities (Arms, wrists, hands, fingers)



AIMS Item 5 Score^a: 2



^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.

Item 6: Lower Extremities (Legs, knees, ankles, toes)





Item 6: Lower Extremities (Legs, knees, ankles, toes)





AIMS Item 6 Score^a: 2

^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.

Item 7: Trunk (Neck, shoulders, hips)





Item 7: Trunk (Neck, shoulders, hips)





AIMS Item 7 Score^a: 1

^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. These patients have consented to Neurocrine's use of their videos and protected health information.

Patient Case Summary







Patient Case Summary

 These movements are consistent with tardive dyskinesia

Facial and Oral Movements:

- Intermittent, low amplitude, lip pursing and pouting
- Movements of lips may be more noticeable when asked to keep mouth open
- Intermittent, low amplitude, athetoid movement of the tongue

Extremity Movements:

- Bilateral, involuntary, and irregular movements of fingers
- Flaring of great toe and inversion of feet at rest and during activation

AIMS Total Dyskinesia Score ^a (Sum of Items 1-7) = 10										
	Facial and Oral Movements	None	Minimal	Mild	Moderate	Severe				
1.	Muscles of facial expression	0	1	2	3	4				
2.	Lips and perioral area	0	1	2	3	4				
3.	Jaw	0	1	2	3	4				
4.	Tongue	0	1	2	3	4				
	Extremity Movements	None	Minimal	Mild	Moderate	Severe				
5.	Upper (arms, wrists, hands, fingers)	0	1	2	3	4				
6.	Lower	0	1		0					
	(legs, knees, ankles, toes)	U	ı	2	3	4				
	(legs, knees, ankles, toes) Trunk Movements	None	Minimal	Mild	Moderate	Severe				
7.			·							

^aThe AIMS score was assessed by blinded central video raters in KINECT 4, a phase 3, open-label, long-term study of valbenazine in adults with tardive dyskinesia. AIMS, Abnormal Involuntary Movement Scale; TD, tardive dyskinesia.





2020 APA Guideline: TD Recommendations

Reversible VMAT2 inhibitors are recommended in patients with moderate to severe or disabling TD

VMAT2 inhibitors can also be considered for patients with mild TD

There is insufficient evidence to support a guideline statement on the use of the following treatments in individuals with TD:

Anticholinergics (e.g., benztropine)

Benzodiazepines (e.g., clonazepam)

Change in antipsychotic therapy to a lower-potency medication

Ginkgo biloba

Cessation or reduction of antipsychotic medication

Amantadine

Vitamin E



Key Takeaways

- The Abnormal Involuntary Movement Scale (AIMS) is used to evaluate dyskinetic movements of patients on antipsychotics or other DRBAs¹
 - TD is an often persistent, clinically distinct DRBA-induced movement disorder that requires specific management^{2,3}
 - The use of EPS as an umbrella term is considered obsolete and potentially clinically problematic⁴
- Regular assessment of TD severity (e.g., via AIMS) at least every 6-12 months is recommended⁵
 - Impact of TD on patient function and quality of life should also be assessed
- There are two FDA-approved VMAT2 inhibitors recommended as first-line treatment of TD⁵

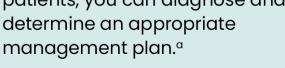
FREE EDUCATIONAL RESOURCES on Tardive Dyskinesia and Other Drug-Induced Movement Disorders

These educational resources were sponsored and developed by Neurocrine Biosciences, Inc.

Discover TD®

Discover TD° is an interactive experience designed to inform health care providers about tardive dyskinesia and other drug-induced movement disorders.

By interacting with hypothetical virtual patients, you can diagnose and



^aFor educational purposes only. Should not be interpreted as medical advice for any particular patient. Individual results may vary.

Experience Discover TD°

mind-td.com/discover-td



DIMD Course

The **DIMD Course** is a free, virtual learning resource for health care providers that delves into



various clinical aspects of the most common DRBA-induced movement disorders.

Join the DIMD Course

dimdcourse.getlearnworlds.com



Neurocrine Medical Website

The **Neurocrine Medical Website**

houses a variety of resources, such as educational podcasts and videos, to assist healthcare providers in the recognition and appropriate differentiation of DRBA-induced movement disorders.

Visit the Neurocrine Medical Website

neurocrinemedical.com



DIMD, drug-induced movement disorder; DRBA, dopamine receptor-blocking agent; TD, tardive dyskinesia.





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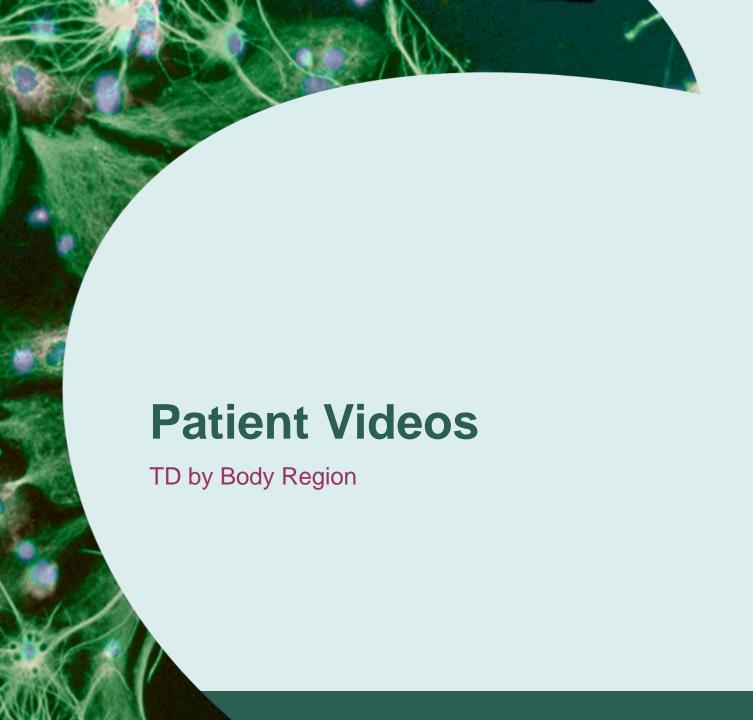
Scoring AIMS: Items 1-12

AIMS is a 12-item, clinician-rated scale used to assess TD severity

	Facial and Oral Movements	None	Minimal	Mild	Moderate	Severe
1.	Muscles of facial expression	0	1	2	3	4
2.	Lips and perioral area	0	1	2	3	4
3.	Jaw	0	1	2	3	4
4.	Tongue	0	1	2	3	4
	Extremity Movements	None	Minimal	Mild	Moderate	Severe
5.	Upper (arms, wrists, hands, fingers)	0	1	2	3	4
6.	Lower (legs, knees, ankles, toes)	0	1	2	3	4
	Trunk Movements	None	Minimal	Mild	Moderate	Severe
7.	Neck, shoulders, hips	0	1	2	3	4
	Global Judgements	None	Minimal	Mild	Moderate	Severe
8.	Overall severity	0	1	2	3	4
9.	Incapacitation	0	1	2	3	4
10.	Patient's awareness*	0	1	2	3	4
	Dental Status	No	Yes			
11.	Current problems with teeth/dentures?	0	1			
12.	Denture use?	0	1			

^{*0=}no awareness; 1=aware, no distress; 2=aware, mild distress; 3=aware, moderate distress; or 4=aware, severe distress. AIMS, Abnormal Involuntary Movement Scale; TD, tardive dyskinesia.

Guy W. ECDEU Assessment Manual for Psychopharmacology: Revised (DHEW publication number ADM 76-338). National Institute of Mental Health, Psychopharmacology Research Branch; 1976:534-537.





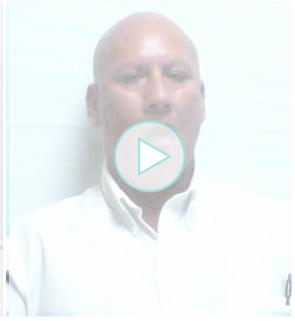




Open Mouth & Tongue

Neck, Shoulder, Hands (Standing and Walking)





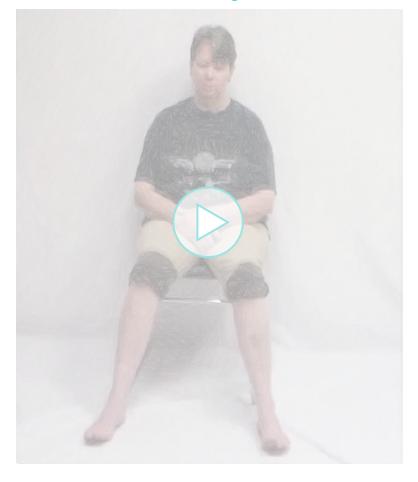


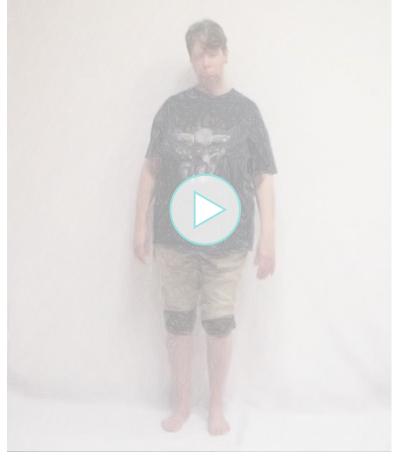
Oral-Buccal-Lingual and Legs



Sitting





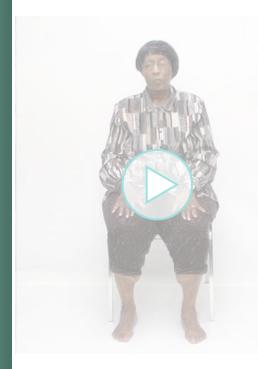


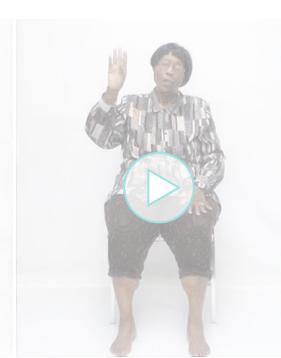


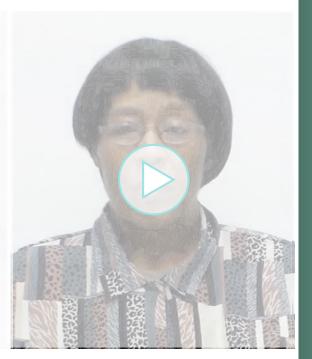
Mild Jaw and Hand



Increased Blinking and Jaw Activation







Leg and Shoulder Dyskinesia



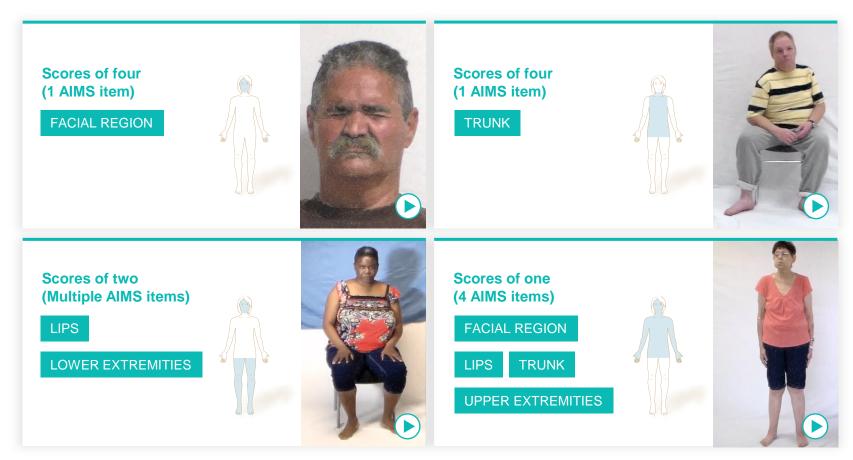
Facial Grimacing and Head Nodding





Impact of AIMS Score on TD Presentation

Each total AIMS score can represent a range of clinical presentations

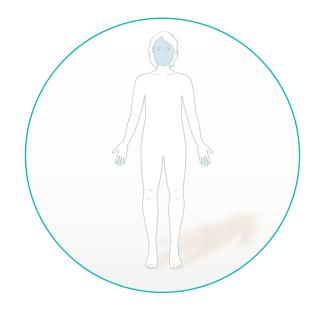


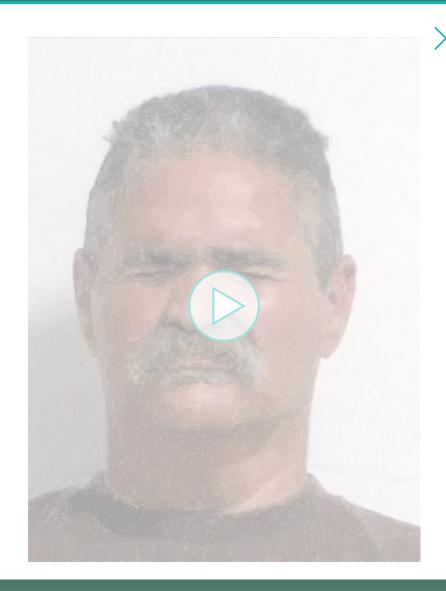
These patients have consented to Neurocrine's use of their videos and protected health information. AIMS, Abnormal Involuntary Movement Scale.

Guy W. ECDEU Assessment Manual for Psychopharmacology: Revised (DHEW publication number ADM 76-338). National Institute of Mental Health, Psychopharmacology Research Branch; 1976:534-537.

Score of four (1 AIMS Item)

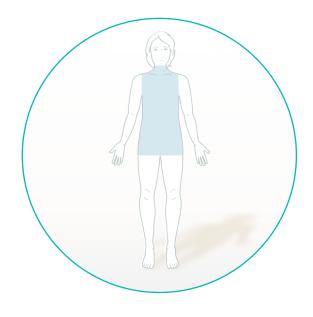
FACIAL REGION





Score of four (1 AIMS Item)

TRUNK

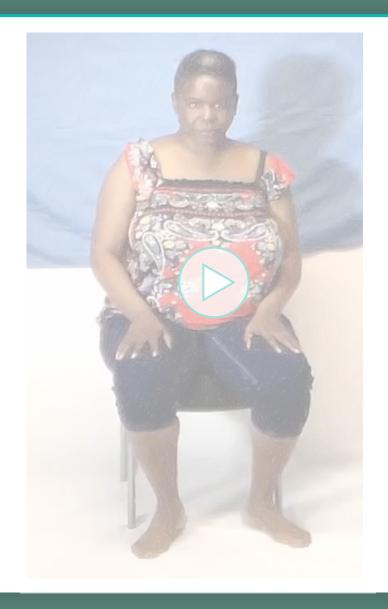




Score of two (2 AIMS Items)

LIPS LOWER EXTREMITIES





Score of one (4 AIMS Items)

FACIAL REGION

LIPS

UPPER EXTREMITIES

TRUNK/NECK

