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**DIEPSS (Drug-Induced Extrapyramidal Symptoms Scale) Evaluation Training Sheet Ver.1.1**


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Study: \_\_\_\_\_

Patient: \_\_\_\_\_

Rater: \_\_\_\_\_

Date of evaluation: Mo. \_\_\_\_\_ Day \_\_\_\_\_ Yr. \_\_\_\_\_

Time of evaluation: \_\_\_\_\_ ~ \_\_\_\_\_

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### Drug-Induced Extrapyramidal Symptoms Scale (DIEPSS)

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This scale is designed to evaluate the severity of drug-induced extrapyramidal symptoms occurring during antipsychotic drug treatment, and consists of 8 individual items and 1 global item. Raters should have medical training and have sufficient knowledge of the evaluation of neurological symptoms. They also need to have sufficient training on how to use this scale so that they can reproduce stable data. Raters should evaluate the subject's symptoms principally from direct interview with the subject and from observations during the interview. Raters should also take information obtained from the ward personnel and from relatives into consideration. In evaluating individual items of tremor, akathisia, dystonia, etc., the subject may sometimes report that the symptoms appear only at certain times other than during the evaluation interview, such as after receiving night medication or before sleep. In such cases, the raters should carefully evaluate the severity of symptoms considering the interview with the subject as well as the information obtained from the ward personnel and relatives. The severest symptoms observed within the rating period determined in the individual research protocols (e.g. recent 24 hours, recent 3 days, etc.) should be considered for evaluation. The following glossary represents guidelines for rating the specific items.

#### The degree of severity

DIEPSS is evaluated in using a five stage rating scale from 0 to 4. There are no intermediate evaluations. If the rater is uncertain which stage to select between two stages or if the evaluation decision is difficult, the more severe stage is selected.

- 0: None, Normal
- 1: Minimal, Questionable
- 2: Mild
- 3: Moderate
- 4: Severe

## 1. Gait

Ask the subject to walk as he/she normally would on the street. Rate slowness of gait in this item, namely, the degree of reduction in speed and step, as well as decrease in pendular arm movement. Also consider the degree of stooped posture and propulsion phenomenon. When the intensity of these symptoms does not fit an anchor point, rate giving priority to the severest symptom observed in the subject. The degree of difficulty in initiating and/or terminating walking should also be considered in rating the item of bradykinesia.

◆ **Anchor Point** Check the appropriate evaluation grade.

- |   |
|---|
| <input type="checkbox"/> 0. Normal.   |
| <input type="checkbox"/> 1. Impression of minimal reduction in speed and step of gait, and minimal decrease in pendular arm movements.  |
| <input type="checkbox"/> 2. Mild reduction in speed and step of gait with mild decrease in pendular arm movements. Mild stooped posture is also observed in some cases.   |
| <input type="checkbox"/> 3. Clearly slowed gait with greatly diminished pendular arm movements. Typical stooped posture and gait with small steps. Propulsion phenomenon is sometimes observed.   |
| <input type="checkbox"/> 4. Initiation of walking alone is barely possible. Even if gait is initiated, the subject shows shuffling gait with very small steps and no pendular arm movements are observed. Severe propulsion phenomenon may be observed. |

Case NO. : \_\_\_\_\_

## 2. Bradykinesia

Reduced activity due to slowness and poverty of movements. Initiating movements is delayed and is sometimes difficult. Rate the degree of poverty of facial expression (mask-like face) and speech during interview (monotonous, slurred speech), as well.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Normal.

1. Impression of slowness in movements.

2. Mild bradykinesia.

Slowed movements and loss of muscle tone.

Slight delay in initiation and/or termination of movements.

Mild reduction in facial expression and rate of speech.

3. Moderate bradykinesia.

Clear impairment in initiating and/or terminating movements.

Rate of speech is moderately slowed, and facial expression is moderately impaired.

4. Severe bradykinesia, or akinesia.

The subject rarely moves, or moves with great effort.

Almost no changes in facial expression (typical mask-like face).

Markedly slowed speech.

Case NO. : \_\_\_\_\_

### 3. Sialorrhea

Rate the severity of excess salivation.

◆ **Anchor Point** Check the appropriate evaluation grade.

- |   |
|---|
| <input type="checkbox"/> 0. Normal.   |
| <input type="checkbox"/> 1. Impression of minimal excess salivation during interview.   |
| <input type="checkbox"/> 2. Mild excess saliva pooling in mouth observed during interview.<br>Little difficulty in speaking.  |
| <input type="checkbox"/> 3. Moderate excess salivation observed during interview.<br>Often results in difficulty in speaking. |
| <input type="checkbox"/> 4. Constantly observed severe excess salivation or drooling.   |

Case NO. : \_\_\_\_\_

## 4. Muscle rigidity

Rate the severity of resistance to flexion and extension of the arms. Rate cogwheeling, waxy flexibility, and the degree of flexibility of wrists, as well.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Absent.

1. Impression of minimal resistance to flexion and extension of the arms.

2. Mild resistance to flexion and extension of the arms.  
Mild cogwheeling is sometimes noted.

3. Moderate resistance to flexion and extension of the arms.  
Obvious cogwheeling may occur.

4. Extreme resistance to flexion and extension of the arms.  
The subject may maintain posture, when interrupted (waxy flexibility).  
Flexion and extension of the arms is sometimes impossible due to extreme muscle rigidity.

Case NO. : \_\_\_\_\_

## 5. Tremor

Repetitive, regular (4-8 Hz), and rhythmic movements observed in the oral region, fingers, extremities, and trunk. Rate principally giving greater weight to the frequency and the severity of the symptoms observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Absent.

1. Non-specific minimal tremor, and/or mild tremor observed intermittently in a single area.

2. Mild tremor is observed persistently in a single area.

Mild tremor in two or more regions and/or moderate tremor in a single area are observed intermittently.

3. Moderate tremor is observed persistently in a single area.

Moderate tremor in two or more regions and/or severe tremor in a single area are observed intermittently.

4. Severe generalized tremor, and/or whole body tremor.

Case NO. : \_\_\_\_\_

## 6. Akathisia

Akathisia consists of subjective inner restlessness, such as awareness of the inability to remain seated, restless legs, fidgetiness, and the desire to move constantly, and of objective increased motor phenomena, such as body rocking, shifting from foot to foot, stamping in place, crossing and uncrossing legs, pacing around. Rate giving greater weight to the severity of subjective symptoms and use the increased motor phenomena as evidence to support subjective symptoms. For example, rate 0 when no awareness of inner restlessness is observed, and rate 1 when only non-specific indefinite inner restlessness is obtained, even if characteristic restless movements of akathisia are observed (pseudoakathisia). In rating akathisia, consider the presence or absence of restlessness throughout the entire examination, as well.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Absent.

1. Non-specific minimal inner restlessness.

2. Awareness of mild inner restlessness not always resulting in subjective distress.  
Characteristic increased motor phenomena of akathisia may be observed.

3. Moderate inner restlessness.  
Results in uncomfortable symptoms and distress.  
Characteristic restless movements of the legs derived from the subjective inner restlessness, such as body rocking, shifting from foot to foot and stamping in place, are observed.

4. Severe inner restlessness.  
Results in the inability to remain seated, or moving the legs constantly.  
Obviously distressing condition which may induce disturbed sleep and/or anxiety states.

Case NO. : \_\_\_\_\_

## 7. Dystonia

Dystonia is a syndrome induced by the hypertonic state of muscles, manifested by stiffness, twisting, spasms, contraction, and persistent abnormal position of muscles observed in the tongue, neck, extremities, trunk, etc. Symptoms include tongue protrusion, torticollis, retrocollis, trismus, oculogyric crisis, Pisa syndrome, etc. Rate only the abnormal degree of increased muscle tone on this item. The degree of abnormal movements resulting from dystonia should be rated in the item of dyskinesia. Rate principally giving greater weight to the frequency and the severity of symptoms observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well. Take the concomitant symptoms into consideration in rating this item, such as the subject's complaint of difficulty in swallowing, thickness of the tongue, etc.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Absent.

1. Impression of minimal muscle tightness, twisting or abnormal posture.

2. Mild dystonia.

Mild stiffness, twisting or spasms observed in tongue, neck, extremities, trunk, or mild oculogyric crisis.

The subject does not always feel distress.

3. Moderate dystonia.

Moderate stiffness, twisting, contraction or oculogyric crisis.

The subject often complains of distress related to the symptoms.

Prompt treatment is desirable.

4. Severe dystonia observed in trunk and/or extremities.

The subject has marked difficulties with activities of daily living, such as eating and walking, due to these symptoms.

Urgent treatment is indicated.

Case NO. : \_\_\_\_\_



## 8. Dyskinesia

Hyperkinetic abnormal movements. Apparently purposeless, irregular, and involuntary movements observed in face (muscles of facial expression), mouth (lips and perioral area), tongue, jaw, upper extremity (arms, wrists, hands, fingers), lower extremity (legs, knees, ankles, toes) and/or trunk (neck, shoulders, hips). Choreic and athetoid movements are rated, but tremor is not included. Rate principally giving greater weight to the frequency and the severity of abnormal involuntary movements observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well. Rate movements that occur upon activation one less than those observed spontaneously.

◆ **Anchor Point** Check the appropriate evaluation grade.

- |  |
|--|
| <input type="checkbox"/> 0. Absent.  |
| <input type="checkbox"/> 1. Non-specific minimal abnormal involuntary movements are observed.<br>Mild abnormal involuntary movements are observed intermittently in a localized area.  |
| <input type="checkbox"/> 2. Mild abnormal involuntary movements are observed persistently in a localized area.<br>Mild abnormal involuntary movements in two or more regions and/or moderate abnormal involuntary movements in a localized area are observed intermittently.       |
| <input type="checkbox"/> 3. Moderate abnormal involuntary movements are observed persistently in a localized area.<br>Moderate abnormal involuntary movements in two or more regions and/or severe abnormal involuntary movements in a localized area are observed intermittently. |
| <input type="checkbox"/> 4. Severe abnormal involuntary movements are observed.<br>The subject has difficulty with activities of daily living due to the symptoms.   |

Case NO. : \_\_\_\_\_

## 9. Overall severity

Rate overall severity of extrapyramidal symptoms, considering the severity and the frequency of individual symptoms, the degree of distress that the subject complains of, that of the effects on the subject's activities of daily living due to the symptoms, and that of the necessity for their treatments.

◆ **Anchor Point** Check the appropriate evaluation grade.

0. Absent.

1. Minimal or questionable.

2. Mild.

Hardly affects the subject's activities of daily living.

Not always feels distress.

3. Moderate.

Affects the subject's activities of daily living to some degree.

Often feels distress.

4. Severe.

Affects the subject's activities of daily living significantly.

Strongly feels distress.

Case NO. : \_\_\_\_\_

## DIEPSS (Drug-Induced Extrapyramidal Symptoms Scale) Rater's Manual

This scale is designed to evaluate the severity of drug-induced extrapyramidal symptoms occurring during antipsychotic drug treatment, and consists of 8 individual items and 1 global item. Raters should have medical training and have sufficient knowledge of the evaluation of neurological symptoms. They also need to have sufficient training on how to use this scale so that they can reproduce stable data. Raters should evaluate the subject's symptoms principally from direct interview with the subject and from observations during the interview. Raters should also take information obtained from the ward personnel and from relatives into consideration. In evaluating individual items of tremor, akathisia, dystonia, etc., the subject may sometimes report that the symptoms appear only at certain times other than during the evaluation interview, such as after receiving night medication or before sleep. In such cases, the raters should carefully evaluate the severity of symptoms considering the interview with the subject as well as the information obtained from the ward personnel and relatives. The severest symptoms observed within the rating period determined in the individual research protocols (e.g. recent 24 hours, recent 3 days, etc.) should be considered for evaluation. The following glossary represents guidelines for rating the specific items.

### 1 | Gait

Ask the subject to walk as he/she normally would on the street. Rate slowness of gait in this item, namely, the degree of reduction in speed and step, as well as decrease in pendular arm movement. Also consider the degree of stooped posture and propulsion phenomenon. When the intensity of these symptoms does not fit an anchor point, rate giving priority to the severest symptom observed in the subject. The degree of difficulty in initiating and/or terminating walking should also be considered in rating the item of bradykinesia.

0 = Normal.

1 = Impression of minimal reduction in speed and step of gait, and minimal decrease in pendular arm movements.

2 = Mild reduction in speed and step of gait with mild decrease in pendular arm movements. Mild stooped posture is also observed in some cases.

3 = Clearly slowed gait with greatly diminished pendular arm movements. Typical stooped posture and gait with small steps. Propulsion phenomenon is sometimes observed.

4 = Initiation of walking alone is barely possible. Even if gait is initiated, the subject shows shuffling gait with very small steps and no pendular arm movements are observed. Severe propulsion phenomenon may be observed.

### 2 | Bradykinesia

Reduced activity due to slowness and poverty of movements. Initiating movements is delayed and is sometimes difficult. Rate the degree of poverty of facial expression (mask-like face) and speech during interview (monotonous, slurred speech), as well.

0 = Normal.

1 = Impression of slowness in movements.

2 = Mild bradykinesia. Slowed movements and loss of muscle tone. Slight delay in initiation and/or termination of movements. Mild reduction in facial expression and rate of speech.

3 = Moderate bradykinesia. Clear impairment in initiating and/or terminating movements. Rate of speech is moderately slowed, and facial expression is moderately impaired.

4 = Severe bradykinesia, or akinesia. The subject rarely moves, or moves with great effort. Almost no changes in facial expression (typical mask like face). Markedly slowed speech.

### 3 | Sialorrhea

Rate the severity of excess salivation.

0 = Normal.

1 = Impression of minimal excess salivation during interview.

2 = Mild excess saliva pooling in mouth observed during interview. Little difficulty in speaking.

3 = Moderate excess salivation observed during interview. Often results in difficulty in speaking.

4 = Constantly observed severe excess salivation or drooling.

## 4 | Muscle rigidity

Rate the severity of resistance to flexion and extension of the arms. Rate cogwheeling, waxy flexibility, and the degree of flexibility of wrists, as well.

- 0 = Absent.
- 1 = Impression of minimal resistance to flexion and extension of the arms.
- 2 = Mild resistance to flexion and extension of the arms. Mild cogwheeling is sometimes noted.
- 3 = Moderate resistance to flexion and extension of the arms. Obvious cogwheeling may occur.
- 4 = Extreme resistance to flexion and extension of the arms. The subject may maintain posture, when interrupted (waxy flexibility). Flexion and extension of the arms is sometimes impossible due to extreme muscle rigidity.

## 5 | Tremor

Repetitive, regular (4-8 Hz), and rhythmic movements observed in the oral region, fingers, extremities, and trunk. Rate principally giving greater weight to the frequency and the severity of the symptoms observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well.

- 0 = Absent.
- 1 = Non-specific minimal tremor, and/or mild tremor observed intermittently in a single area.
- 2 = Mild tremor is observed persistently in a single area. Mild tremor in two or more regions and/or moderate tremor in a single area are observed intermittently.
- 3 = Moderate tremor is observed persistently in a single area. Moderate tremor in two or more regions and/or severe tremor in a single area are observed intermittently.
- 4 = Severe generalized tremor, and/or whole body tremor.

## 6 | Akathisia

Akathisia consists of subjective inner restlessness, such as awareness of the inability to remain seated, restless legs, fidgetiness, and the desire to move constantly, and of objective increased motor phenomena, such as body rocking, shifting from foot to foot, stamping in place, crossing and uncrossing legs, pacing around. Rate giving greater weight to the severity of subjective symptoms and use the increased motor phenomena as evidence to support subjective symptoms. For example, rate 0 when no awareness of inner restlessness is observed, and rate 1 when only non-specific indefinite inner restlessness is obtained, even if characteristic restless movements of akathisia are observed (pseudokathisia). In rating akathisia, consider the presence or absence of restlessness throughout the entire examination, as well.

- 0 = Absent.
- 1 = Non-specific minimal inner restlessness.
- 2 = Awareness of mild inner restlessness not always resulting in subjective distress. Characteristic increased motor phenomena of akathisia may be observed.
- 3 = Moderate inner restlessness. Results in uncomfortable symptoms and distress. Characteristic restless movements of the legs derived from the subjective inner restlessness, such as body rocking, shifting from foot to foot and stamping in place, are observed.
- 4 = Severe inner restlessness. Results in the inability to remain seated, or moving the legs constantly. Obviously distressing condition which may induce disturbed sleep and/or anxiety states. Subject strongly desires relief of symptoms.

## 7 | Dystonia

Dystonia is a syndrome induced by the hypertonic state of muscles, manifested by stiffness, twisting, spasms, contraction, and persistent abnormal position of muscles observed in the tongue, neck, extremities, trunk, etc. Symptoms include tongue protrusion, torticollis, retrocollis, trismus, oculogyric crisis, Pisa syndrome, etc. Rate only the abnormal degree of increased muscle tone on this item. The degree of abnormal movements resulting from dystonia should be rated in the item of dyskinesia. Rate principally giving greater weight to the frequency and the severity of symptoms observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well. Take the concomitant symptoms into consideration in rating this item, such as the subject's complaint of difficulty in swallowing, thickness of the tongue, etc.

0 = Absent.

1 = Impression of minimal muscle tightness, twisting or abnormal posture.

2 = Mild dystonia. Mild stiffness, twisting or spasms observed in tongue, neck, extremities, trunk, or mild oculogyric crisis. The subject does not always feel distress.

3 = Moderate dystonia. Moderate stiffness, twisting, contraction or oculogyric crisis. The subject often complains of distress related to the symptoms. Prompt treatment is desirable.

4 = Severe dystonia observed in trunk and/or extremities. The subject has marked difficulties with activities of daily living, such as eating and walking, due to these symptoms. Urgent treatment is indicated.

## 8 | Dyskinesia

Hyperkinetic abnormal movements. Apparently purposeless, irregular, and involuntary movements observed in face (muscles of facial expression), mouth (lips and perioral area), tongue, jaw, upper extremity (arms, wrists, hands, fingers), lower extremity (legs, knees, ankles, toes) and/or trunk (neck, shoulders, hips). Choreic and athetoid movements are rated, but tremor is not included. Rate principally giving greater weight to the frequency and the severity of abnormal involuntary movements observed objectively, however, consider the degree of distress that the subject complains of and that of the effects on the subject's quality of life due to the symptoms, as well. Rate movements that occur upon activation one less than those observed spontaneously.

0 = Absent.

1 = Non-specific minimal abnormal involuntary movements are observed. Mild abnormal involuntary movements are observed intermittently in a localized area.

2 = Mild abnormal involuntary movements are observed persistently in a localized area. Mild abnormal involuntary movements in two or more regions and/or moderate abnormal involuntary movements in a localized area are observed intermittently.

3 = Moderate abnormal involuntary movements are observed persistently in a localized area. Moderate abnormal involuntary movements in two or more regions and/or severe abnormal involuntary movements in a localized area are observed intermittently.

4 = Severe abnormal involuntary movements are observed. The subject has difficulty with activities of daily living due to the symptoms.

## 9 | Overall severity

Rate overall severity of extrapyramidal symptoms, considering the severity and the frequency of individual symptoms, the degree of distress that the subject complains of, that of the effects on the subject's activities of daily living due to the symptoms, and that of the necessity for their treatments.

0 = Absent.

1 = Minimal or questionable.

2 = Mild. Hardly affects the subject's activities of daily living. Not always feels distress.

3 = Moderate. Affects the subject's activities of daily living to some degree. Often feels distress.

4 = Severe. Affects the subject's activities of daily living significantly. Strongly feels distress.

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DIEPSS (Drug-Induced Extrapyrarnidal Symptoms Scale) Evaluation Sheet for All Items

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Study: _____	Code: _____
Patient: _____	0 = None, Normal
Rater: _____	1 = Minimal, Questionable
Date of evaluation: Mo. _____ Day _____ Yr. _____	2 = Mild
Time of evaluation: _____ ~ _____	3 = Moderate
Read the rater's manual of DIEPSS carefully, for detailed explanation of anchor points.	4 = Severe

Circle one as appropriate.

**1 Gait**

Shuffling, slow gait. Evaluate the degree of reduction in speed and step, decrease in pendular arm movement, stooped posture and propulsion phenomenon. 0 1 2 3 4

**2 Bradykinesia**

Slowness and poverty of movements: Delay and/or difficulty in initiating and/or terminating movements. Rate degree of poverty of facial expression (mask-like face) and monotonous, slurred speech, as well. 0 1 2 3 4

**3 Sialorrhea**

Excess salivation. 0 1 2 3 4

**4 Muscle rigidity**

Resistance to flexion and extension of upper arms. Rate cogwheeling, waxy flexibility, lead-pipe rigidity and the degree of flexibility of wrists, as well. 0 1 2 3 4

**5 Tremor**

Repetitive, regular (4-8 Hz), and rhythmic movements observed in the oral region, fingers, extremities, and trunk. 0 1 2 3 4

**6 Akathisia**

Subjective inner restlessness and related distress; awareness of the inability to remain seated, restless legs, fidgety feelings, desire to move constantly, etc. Rate increased motor phenomena (body rocking, shifting from foot to foot, stamping in place, crossing and uncrossing legs, pacing around, etc.), as well. 0 1 2 3 4

**7 Dystonia**

Symptoms induced by the hypertonic state of muscles. Stiffness, twisting, and persistent abnormal position of muscles observed in tongue, neck, extremities, trunk, etc. Rate tongue protrusion, torticollis, retrocollis, trismus, oculogyric crisis, Pisa syndrome, etc. 0 1 2 3 4

**8 Dyskinesia**

Hyperkinetic abnormal movements. Apparently purposeless, irregular, and involuntary movements observed in face, mouth, tongue, jaw, extremities and/or trunk. Include choreic and athetoid movements, but do not rate tremor. 0 1 2 3 4

**9 Overall severity**

Overall severity of extrapyramidal symptoms. 0 1 2 3 4

**DIEPSS (Drug-Induced Extrapyrarnidal Symptoms Scale)  
Evaluation Training Sheet**

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