Figure 9. Algorithms to Classify Movement Disorders

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Let

$$A_i = a_0 + a_1Y_1 + a_2Y_2 + \ldots + a_{23}Y_{23} + b_1\acute{Y}_1 + b_2\acute{Y}_2 + \ldots + b_{23}\acute{Y}_{23} + c_1Z_1 + c_2Z_2 + \ldots + c_4Z_4 \quad (7)$$

where $a_0 = 0$, $a_i = 0$ or 1, $b_i = 0$ or 1, $1 <= i <= 23$, and $c_j = 0$ or 1, $1 <= j <= 4$, are scalars, and Y_i, $\acute{Y}_i$, $1 <= i <= 23$, and Z_j, $1 <= j <= 4$, are the indicator functions defined in Equations (1) through (6) (See Figure 8).

- *Algorithm for stereotypy*. Let

$$A_1 = Y_5 + Y_6 + Y_{11} + Y_{16} + Z_1 \quad (8)$$

Then stereotypy is present if $Y_5 = Y_6 + Y_{11} + Y_{16} + Z_1 = 1$ by Equation (3), or, equivalently, if $A_1 = 5$ by Equation (8).

- *Algorithm for akathisia*. Let

$$A_2 = Y_5 + Y_6 + Y_{11} + Y_{16} + Z_1 + Z_2 \quad (9)$$

Note also that by Equation (8)

$$A_2 = A_1 + Z_2 \quad (10)$$

Then akathisia is present by Equation (9) if $Y_5 = Y_6 = Y_{11} = Y_{16} = Z_1 = Z_2 = 1$, or, equivalently, if both $A_1 = 5$ and $Z_2 = 1$ by Equations (4), (8), and (9), or, equivalently, if $A_2 = 6$ by Equations (9) and (10). Thus, all individuals with akathisia must also manifest stereotypy.

- *Algorithm for chorea.* Let

$$A_3 = Y_2 + Y_3 + Y_5 + Y_9 + \acute{Y}_{15} \quad (11)$$

Then chorea is present if $Y_2 = Y_3 = Y_5 = Y_9 = \acute{Y}_{15} = 1$, or, equivalently, if $A_3 = 5$by Equation (11).

- *Algorithm for dystonia.* Let

$$A_4 = Y_{11} + Y_{21} + Z_3 \quad (12)$$

Then dystonia is present if $Y_{11} = Y_{21} = Z_3 = 1$, or, equivalently, if $A_4 = 3$ by Equation (12).

- *Algorithm for myoclonus.* Let

$$A_5 = Y_3 + Y_{18} + Y_{20} \quad (13)$$

Then myoclonus is present if $Y_3 = Y_{18} = Y_{20} = 1$, or, equivalently, if $A_5 = 3$ by Equation (13).

- *Algorithm for tic.* Let

$$A_6 = \acute{Y}_5 + Y_2 + Y_3 + Y_4 + Y_8 \quad (14)$$

Then tic is present if $\acute{Y}_5 = Y_2 = Y_3 = Y_4 = Y_8 = 1$, or, equivalently, if $A_6 = 5$ by Equation (14).

- *Algorithm for tremor.* Let

$$A_7 = Y_{10} + Z_4 \quad (15)$$

Then tremor is present if $Y_{10} = Z_4 = 1$ by Equation (6), or, equivalently, if $A_7 = 2$ by Equation (15).