Clock Drawing Test (CDT)

- Useful adjunct to the MMSE test in cognitive screening
- Tests executive function primarily
- Has widespread clinical use despite inconsistent scoring and interpretation
  - -visual record for the chart
  - -takes less than a minute to perform
  - -reflects change in cognition over time
  - -has educational impact on the family or caregivers

There are multiple scoring systems, so just use the simplest one you can remember. If you are unsure how to score it, simply describe the patient's efforts in your note.

Standard Instructions

1. Use pre-drawn circle
2. "Please draw the numbers of the clock." Allow them to complete.
3. "Please set the time at ten minutes after eleven."

In general, look first at symmetry of the numbers of the clock. This can indicate whether or not the patient was able to plan ahead. Leaving numbers out, repeating numbers, or continuing past the number 12 is also an indication of abnormality.

Secondly, look at the hands. We deliberately choose a time that is not straightforward because we are looking for disinhibition or "frontal pull." The time 'ten after eleven' requires that the patient inhibit a reflex to put the hands at the numbers 10 and 11. This also requires abstract thinking to translate the concept of time into a drawing.

Next, included instructions on five methods of scoring and following that are examples of real patients clock drawings to practice interpretation.

The patient is asked to draw a clock face with all the numbers and hands and then to state the time as drawn. The number 12 must appear on top (3 points), there must be 12 numbers present (1 point), there must be two distinguishable hands (1 point), and the time must be identified correctly (1 point) for full credit. A score less than 4 is considered impaired. Stahelin et al. Int Psychogeriatr 1997.

CAMDEX scoring system (involves drawing their own circle)

0 No reasonable representation of a clock	—No clock face drawn —Numbers not in correct position —Incorrect time
1	—One of the 3 items mentioned in score 0 is correct
2	—Two of the 3 items mentioned in score 0 is correct
3 Perfect clock	—All items are correctly represented

SHULMAN scoring system (Shulman et al., 1993)

0 No reasonable representation of a clock
—No attempts at all
—No semblance of a clock at all
—Writes a word or name

1 Severe level of disorganisation as described in 2

2 Moderate visio-spatial disorganisation of times such that accurate denotation of 10 after 11 is impossible
—Moderately poor spacing
—Omits numbers
—Perseveration—repeats circle or continues on past 12 to 13, 14, 15 etc.
—Right-left reversal—numbers drawn counterclockwise
—Dysgraphia—unable to write numbers accurately

3 Inaccurate representation of 10 after 11 when visiospatial organisation is perfect or shows only minor deviations
—Minute hand points to 10
—Writes '10 after 11'
—Unable to make any denotation of time

4 Minor visiospatial errors
—A mildly impaired spacing of times
—Draws times outside circle
—Turns page while writing numbers so that some numbers appear upside down
—Draws in lines (spokes) to orient spacing

5 Perfect clock

Method for evaluating clock drawings described by Sunderland and colleagues[14]

Score	Criterion
10–6	**Drawing of clock face with circle and number is generally intact.**
10	Hands are in correct position.
9	Slight errors in placement of the hands.
8	More noticeable errors in the placement of hour and minute hands.
7	Placement of hands is significantly off course.
6	Inappropriate use of clock hands (i.e., use of digital display or circling of numbers despite repeated instructions).
5–1	**Drawing of clock face with circle and numbers is *not* intact.**
5	Crowding of numbers at one end of the clock or reversal of numbers. Hands may still be present in some fashion.
4	Further distortion of number sequence. Integrity of clock face is now gone (i.e., numbers missing or placed at outside of the boundaries of the clock face).
3	Numbers and clock face no longer obviously connected in the drawing. Hands are not present.
2	Drawing reveals some evidence of instructions being received but only a vague representation of a clock.
1	Either no attempt or an uninterpretable effort is made.

Scores

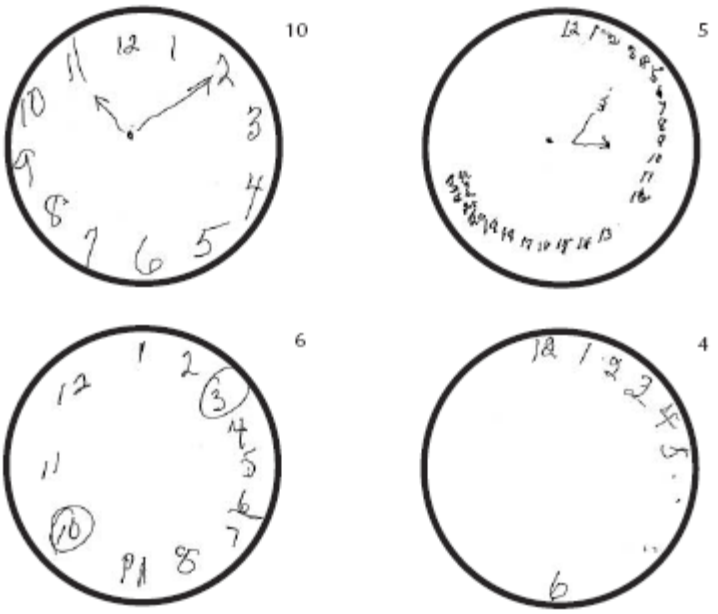

Fig. 2: Method described by Sunderland and colleagues[14] for scoring clock drawings. As described in Fig. 1, patients are given a predrawn circle and asked to draw a clock and the time as "10 past 11." Top: Scoring criteria. Bottom: Examples of clock drawings and scores derived using this method. Scores of 6 or more are considered normal.

Method for evaluating clock drawings described by Watson and colleagues[13]

1. Divide the circle into 4 equal quadrants by drawing one line through the centre of the circle and the number 12 (or a mark that best corresponds to the 12) and a second line perpendicular to and bisecting the first.
2. Count the number of digits in each quadrant in the clockwise direction, beginning with the digit corresponding to the number 12. Each digit is counted only once. If a digit falls on one of the reference lines, it is included in the quadrant that is clockwise to the line. A total of 3 digits in a quadrant is considered to be correct.
3. For any error in the number of digits in the first, second or third quadrants assign a score of 1. For any error in the number of digits in the fourth quadrant assign a score of 4.
4. Normal range of score is 0–3. Abnormal (demented) range of score is 4–7.

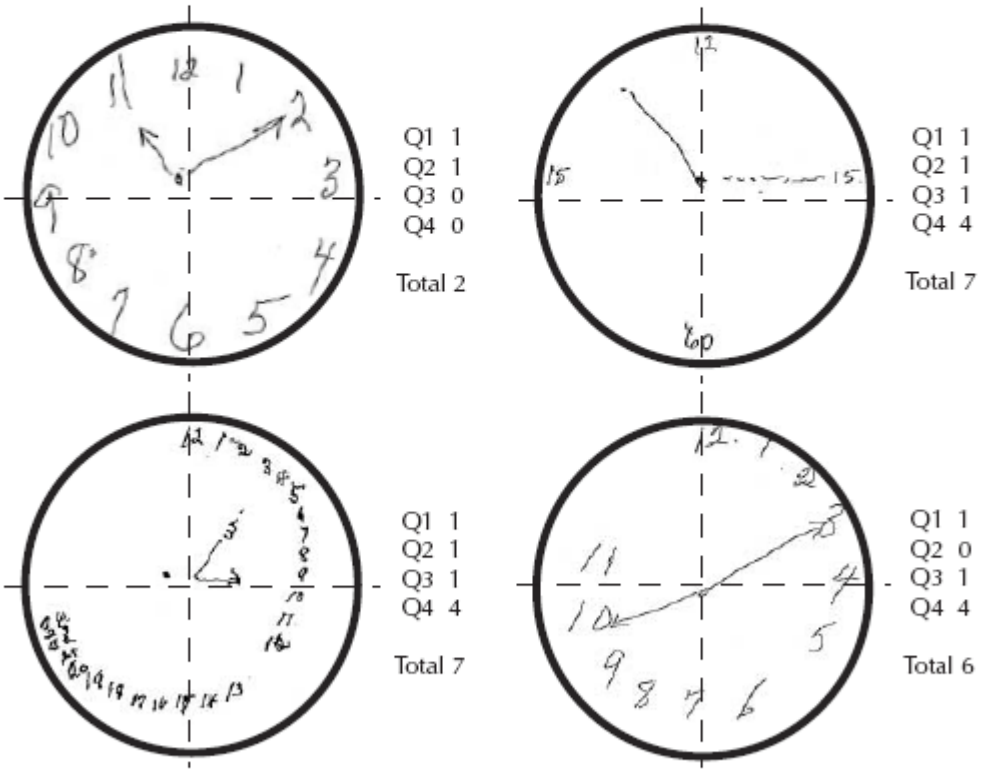

Fig. 1: Method described by Watson and colleagues[13] for scoring clock drawings. Patients are given a predrawn circle and asked to draw numbers on it to make it look like a clock. They are then asked to draw the hands of the clock to read "10 past 11." Top: Scoring criteria. Bottom: Examples of patients' clock drawings and scores derived using this method.