

CONTRAST SENSITIVITY RECORDING FORM

INSTRUCTIONS FOR USE

The Contrast Sensitivity Curve

Whereas traditional letter chart acuity is measured with letters or symbols of high contrast, contrast sensitivity describes the ability of the visual system to identify objects with lesser levels of contrast. As contrast decreases, larger symbols are needed. This relationship is plotted as a “contrast sensitivity curve”. Knowledge of this relationship is important, since most daily activities involve objects that are larger than the letters on a letter chart, yet are seen with less than black-on-white contrast.

In the diagram the horizontal axis represents (from left to right) symbols of decreasing angular size, requiring increasing levels of visual acuity. The vertical axis represents (from bottom to top) symbols of decreasing contrast, requiring increasing contrast sensitivity. The bottom-left area represents large symbols with high contrast that will always be seen; the top-right area represents very small symbols of very low contrast that will never be seen. The contrast sensitivity curve indicates the boundary between these two areas.

The column labels at the bottom indicate visual acuity values in different notations. The row labels on the right indicate contrast levels and the corresponding contrast sensitivity value ($CS = 1/\text{contrast threshold}$). These values follow a logarithmic (geometric) progression. The row labels on the left provide a linear scale, based on the logarithm of the contrast sensitivity value. Linear scales are better suited for calculations and graphical displays. The left-hand side also provides letter-count scores for the Pelli-Robson (P-R) and Mars (M) charts. Simply counting the number of letters seen provides the simplest way of recording the results of these tests.

Traditional (high contrast) acuity

Find the row for 100% contrast, move to the right and place a mark in the column that indicates the visual acuity. Make sure that the chart is presented at the distance for which it was designed and use the visual acuity values that are indicated on the chart. If the chart is used at any other distance, the acuity values on the chart are not valid.

Low contrast acuity

Precision Vision makes low contrast charts with various letters and symbols at 25%, 10%, 5%, 2.5% and 1.25% contrast. Find the row for the applicable contrast level, move to the right and place a mark in the column that indicates the visual acuity for that contrast level. Comparing the High Contrast (HC) and Low Contrast (LC) marks provides an estimate of the **slope** of the contrast sensitivity curve. Measuring at several contrast levels provides a more detailed description of the contrast sensitivity curve.

Pelli-Robson (P-R) test, Mars (M) test and Rabin (R) test.

The Pelli-Robson (P-R) and Mars (M) tests provide large letters of fixed size and variable contrast to determine the **peak** of the contrast sensitivity curve. Present the test at the recommended distance (1 meter for the P-R wall chart, 50 cm for the hand-held Mars card). Find the number of letters identified correctly in the applicable column on the left. On that row, place a mark in the column that is marked “P-R” or “M” at the top. The Rabin test follows the same principles with smaller letters; use the letter counts in the P-R column, place the mark in the column marked “R”.

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Use "R" marks for OD, "L" marks for OS

Patient name: _____ Date: _____

Comments: _____

P-R count	Mars letter count	Log CS	P-R	M	R	Contrast Threshold	Contrast Sensitivity																
40,41		2.0				1%	100																
38,39	47,48	1.9				1.25%	80																
36,37	44,45,46	1.8				1.6%	63																
34,35	42,43	1.7				2%	50																
32,33	39,40,41	1.6				2.5%	40																
30,31	37,38	1.5				3.2%	32																
28,29	34,35,36	1.4				4%	25																
26,27	32,33	1.3				5%	20																
24,25	29,30,31	1.2				6.3%	16																
22,23	27,28	1.1				8%	12.5																
20,21	24,25,26	1.0				10%	10																
18,19	22,23	0.9				12.5%	8.0																
16,17	19,20,21	0.8				16%	6.3																
14,15	17,18	0.7				20%	5.0																
12,13	14,15,16	0.6				25%	4.0																
10,11	12,13	0.5				32%	3.2																
8,9	9,10,11	0.4				40%	2.5																
6,7	7,8	0.3				50%	2.0																
4,5	4,5,6	0.2				63%	1.6																
2,3	2,3	0.1				80%	1.25																
0,1	0,1	0.0				100%	1.0																
Symbol acuity US notation			20/1000	20/800	20/630	20/500	20/400	20/320	20/250	20/200	20/160	20/125	20/100	20/80	20/63	20/50	20/40	20/32	20/25	20/20	20/16	20/12.5	20/10
Symbol acuity 6 m notation			6/300	6/240	6/190	6/150	6/120	6/95	6/75	6/60	6/48	6/38	6/30	6/24	6/19	6/15	6/12	6/9.5	6/7.5	6/6	6/4.8	6/3.8	6/3
Symbol acuity decimal notation			0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.16	0.20	0.25	0.32	0.40	0.50	0.63	0.80	1.00	1.25	1.60	2.00
Grating acuity cycles / degree			0.6	0.8	1.0	1.2	1.5	2	2.4	3	3.8	4.8	6	7.5	9.5	12	15	19	24	30	38	48	60

