

be used only for each of the six individual regions separately.

Bulk stereometric analysis of the arterial bed of the heart based on the results of planimetric investigation of histological preparations must therefore be carried out on sections in three mutually perpendicular planes through the myocardium, followed by summation of these results. The basic mathematics of the method shows that the conclusion regarding the bulk density of distribution of the intramyocardial arteries purely from the results of planimetry of a section in one plane will always give rise to a systematic error, consisting of an underestimation of the bulk density of the components.

Planimetric analysis of the arterial bed of the myocardium can be used to obtain stereometric constants for different regions of the heart under normal and pathological conditions.

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QUANTITATIVE EVALUATION OF ERYTHEMA OF THE SKIN

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Special colorimetric scales for estimating erythema of the skin have been developed on the basis of general views regarding the objective nature of color perception and of colorimetric tables in a color atlas. These scales can be used to estimate common or allergic inflammation of the skin produced experimentally in the course of acute and chronic diseases. The system of the evaluation takes into account experience obtained with the assessment of inflammation of the skin on a point scale and the description of the erythema with the aid of the three physical parameters of color: its brightness (ρ , %), its wavelength (λ , nm), and its saturation (P , %).

KEY WORDS: *erythema; brightness; saturation; wavelength; color tone.*

The physiological basis of the theory of color [1, 2] enables a diagnostic feature of inflammation of the skin of such importance as erythema to be objectively assessed on the basis of E. B. Rabkin's "Color Atlas."

A technically simple method of objective evaluation of erythema of the skin in experimental animals with the aid of the colorimetric scale was described previously [3, 4]. This method is perfectly suitable for practical use in clinical and experimental research. The scale was based on a scale of different levels of increase in saturation of a pure red color tone. It covers the whole range of types of reddening of the skin likely to be observed in practice. For each chromatic object the basic characteristics are given: the wavelength λ , the brightness ρ , and the saturation P . However, considering that in experimental and clinical practice the colors to be assessed are not monochromatic but mixed colors (purple, reddish-orange) with strongly saturated and heterochromatic characteristics, three additional variants of the colorimetric scale are suggested.

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TABLE 1. Physical Parameters and Point Ratings Corresponding to Regions of Scale No. 1 for Experimental Research

Region No.	Points	Physical parameters of color		
		Brightness, ρ , %	wavelength λ , nm	saturation P , %
2/4	0	45	615	9
2/6	0	33,5	605	8
2/8	0	26,5	600	7
3/5	1	40	625	12
3/7	1	30	620	9
3/9	1	23	615	8
4/6	2	33,5	652	16
4/8	2	26,5	635	14
4/10	2	20	628	12
5/7	3	30	700	19,5
5/9	3	23	700	17
5/11	3	17	680	15
6/8	4	26,5	700	26
6/10	4	20	700	20
6/12	4	15	700	17

TABLE 2. Physical Parameters and Point Ratings Corresponding to Regions of Scale No. 2 for Clinical and Experimental Research

Region No.	Points	Physical parameters of color		
		brightness, ρ , %	wavelength λ , nm	saturation P , %
2/2	0	68	700	3
2/4	0	43,5	—	—
3/3	1	55	496	5
3/5	1	35	—	—
4/4	2	43,5	497	8
4/6	2	28,5	700	3
4/8	2	20,5	700	3
5/5	3	35	498	12
5/7	3	24	497,5	9
5/9	3	17	496,5	7
6/6	4	28,5	498	13,5
6/8	4	20,5	498	12
6/10	4	14	497,5	10,5
7/7	5	24	497,5	17,5
7/9	5	17	497,5	17,5
7/11	5	12,5	497,5	17

TABLE 3. Physical Parameters and Point Ratings Corresponding to Regions of Correcting Scale No. 3 for Clinical and Experimental Research

Region No.	Points	Physical parameters of color		
		brightness ρ , %	wavelength λ , nm	saturation P , %
2/4	0	48,5	589	16
2/6	0	32,5	588	14
2/8	0	23,5	587	10
3/5	1	39,5	592	26
3/7	1	27,5	590	22
3/9	1	20,0	589	18
4/6	2	59,5	595	36
4/8	2	23,5	594	33
4/10	2	18,5	593	28
5/7	3	27,5	599	48
5/9	3	20,0	597,5	43
5/11	3	16,5	596	38

In special experiments on guinea pigs with white fur the most common variants of color tones were established on the basis of their principal parameters. These color tones correspond to the following areas in Table 1 of E. B. Rabkin's "Color Atlas": 2/4, 2/6, 2/8, 3/5, 3/7, 3/9, 4/6, 4/8, 4/10, 5/7, 5/9, 5/11, 6/8, 6/10, 6/12; and in Table 2: 2/4, 2/6, 2/8, 3/5, 3/7, 3/9, 4/6, 4/8, 4/10, 5/7, 5/9, 5/11; and in Table 12: 2/2, 2/4, 3/3, 3/5, 4/4, 4/6, 4/8, 5/5, 5/7, 5/9, 6/6, 6/8, 6/10, 7/7, 7/9, 7/11.

Boundaries of the color regions in each of the above-mentioned tables of the "Color Atlas" with the aid of which many different types of erythema can be assessed were established analytically. The color regions in Tables 1, 2, and 12 of the "Color Atlas," chosen with the aid of experiments on animals, were used to form the basis of three colorimetric scales: the first scale is intended for experimental research, the second for assessing erythema in clinical and experimental investigations, and the third (correcting scale) for clinical and experimental research. The physical parameters of color of each scale and their corresponding point regime are given in Tables 1, 2, and 3.

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