Waldmann
ENGINEERS OF LIGHT

# CHALLENGE
## HOW BEST TO EVALUATE CLINICAL LIGHTING

Clinical lighting is an invaluable instrument for medical professionals as it assists in precise examinations and improved patient care. Quality lighting also plays an important role in eliminating eye strain, fatigue, and discomfort, affecting productivity and general well-being. To assist you in selecting the best exam and procedure light for your hospital or clinic, we have identified and prioritized the factors that are essential when choosing a medical light fixture.

**Factors to Consider When Selecting Clinical Lighting**

**1. Illuminance** **2. Color Temperature** **3. Color Rendering** **4. Light Source**

### Illuminance

Illuminance, or the luminous flux on a surface area with the unit 'lux' – is probably the most significant measurement in lighting technology, identifying the intensity of light at a specific distance. According to the International Electrotechnical Commission (IEC), luminaires for use in an examination setting should have a minimum 1,000 lux. For reference, the illuminance of daylight during a clear, sunny day is 100,000 lux. Typically, medical examination lights offer 30,000 - 50,000 lux at 0.5 meter and minor procedure lights attain 60,000 -100,000 lux at 1 meter. As brightness is a central consideration when selecting an exam or minor procedure light, dimming, LED quality and other features should also be considered when choosing a light for medical examinations or procedures.

### Color Temperature

Color temperature is the measurement of color relative to that of full sunlight (5,800K). Maintaining optimal color temperature is critically important in the medical field, as it displays the color and rendition of body tissue and fluids. Color temperature is measured in Kelvin units and reflects the "warmth" or "coolness" of a light source.

When choosing an examination fixture, the optimal color temperature depends on the application. Any color temperature less than 5,800K will have an orange/yellow (warm) cast, while a higher color temperature will have a blue (cool) cast. The option to adjust color temperature for specific application is ideal. For instance, cool tones will emphasize veins, while warmer tones make lesions and skin inflammation more visible.

### Color Rendering Index

The Color Rendering Index (CRI) measures light's ability to present color "naturally," including all frequencies of the color spectrum. The higher the CRI, the more accurately the "true color" is represented. A low CRI will indicate that the color is being distorted, lacking a full display of the color spectrum. A high CRI of at least 85 is recommended for medical examinations.

### Color Temperature Scale


3,500 - 4,000K general exam/general dermatology
4,500 - 5,000K surgeries/minor procedures
5,000 - 6,000K dental
6,000 - 6,500K magnification lighting for dermatology

### Light Source

In considering an examination light, traditionally, halogen lighting solutions have been used in hospital and clinical settings. They are increasingly being replaced by LED solutions due to several benefits: LED offers bright, uniform illumination while consuming less power, and also allows for special optics that can be incorporated to attain more light and minimize glare. Also, the long maintenance-free LED service life (up to 50,000 or more hours) saves on cost, time and convenience, compared to halogen bulb life (2,000 hours). Finally, due to new LED technology, lux levels are able to reach very high numbers (more brightness) without emitting any additional heat, ensuring comfort for patient and practitioner.

# SOLUTION

As medical professionals evaluate clinical lighting, careful consideration of illuminance, color temperature, CRI and light source are essential. When these lights are able to satisfy criteria for a wide variety of tasks, for instance with color temperature and dimming options, the practitioner has much more flexibility, allowing a particular fixture to meet several lighting needs.

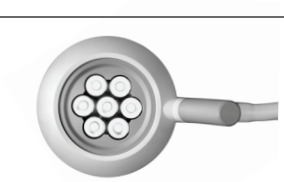
## WALDMANN CLINICAL LIGHTING PRODUCT SOLUTIONS

**WALDMANN TRIANGO 100**
**Minor Procedure Light**

**Illuminance:** 100,000 lux at 1 m / Special light head and optic designs reduce shadows / Four dimming levels modify light intensity
**Color Temperature:** Available in 4,300K or with adjustable color temperatures: 3,700K/ 4,300K/ 4,700K for flexibility in applications.
**Color Rendering:** High CRI Ra>95
**Light Source:** LED - no heat emitted from the light source

**WALDMANN VISIANO 20-2**
**Minor Procedure Light**

**Illuminance:** 60,000 lux at 0.5 m / Special light head and optic designs reduce shadows / Four dimming levels modify light intensity
**Color Temperature:** Color changing 3,500 to 4,500K for flexibility in applications.
**Color Rendering:** High CRI Ra>95
**Light Source:** LED - no heat emitted from the light source



**WALDMANN VISIANO 10-1**
**Examination Light**

**Illuminance:** 50,000 lux at 0.5 m / Special optic design reduces shadows / Compact size for easy storage and convenience
**Color Temperature:** 4,400K
**Color Rendering:** High CRI Ra>93
**Light Source:** LED - no heat emitted from the light source

**WALDMANN OPTICLUX**
**Magnifier Light & Wood Light**

**Illuminance:** 6,000 lux at 0.15 m / Continuously dimmable 100% to 10% / Special model for dermatology, veterinary and forensic medicine combines two lighting modes: daylight white and Wood light versions / Premium LEDs ensure less shadow formation
**Color Temperature:** 6,500K
**Color Rendering:** High CRI Ra>95
**Light Source:** LED - no heat emitted from the light source
**Magnification:** 1.9X (3.5 diopters)

**WALDMANN HALUX LED**
**Examination Light**

**Illuminance:** 40,000 lux at 0.5 m / Five dimming levels for all types of examinations / Shadow reducing due to special optic design
**Color Temperature:** Available in 4,400K or with adjustable color temperatures: 3,300 / 3,800 / 4,400K for flexibility in applications
**Color Rendering:** High CRI Ra>93
**Light Source:** LED - no heat emitted from the light source

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