

## Example of patient room planning

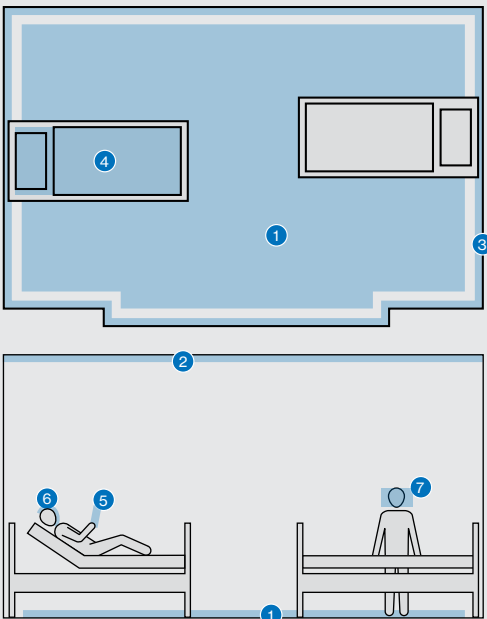
Draw inspiration for the design of comfortable patient rooms from the examples of planning options using the VITA MED bed light.

In the current floor plan of a two-bed room, the beds are placed slightly offset against opposite fascia panelled walls. The VITA MED bed light is mounted, at a height of 180 centimetres, as a continuous duct on the fascia panel. Three VITA MED light insets for each bed provide pleasant, indirect light upwards. A light insets, in the centre above the bed, provides direct light downwards.

### Lighting Specifications

- Very good colour rendering  $CRI \geq 90$  / optional  $CRI \geq 98$
- Dynamic intensity gradients using the DALI light control
- No glare
- Ceilings and upper wall surfaces are brightly illuminated
- Examination light meets the requirement of  $< 500 \text{ lx}$
- Illuminance: All specifications in EN 12464-1:2021, both the minimum values and the modified values, are exceeded
- Melanopic response: The required vertical and cylindrical illuminance levels are met in accordance with the age correction factors for 75-year-old observers in accordance with DINT/S 5130-100

## Specifications



### Measurement area

- 1 Floor
- 2 Ceiling
- 3 Walls
- 4 Examination level /  $H = 85 \text{ cm}$
- 5 Reading range /  $H = 110 \text{ cm} / 30 \times 90 \text{ cm}$
- 6 Field of vision / Vertical patient head measurement area /  $30 \times 30 \text{ cm}$
- 7 Staff / Cylindrical nursing staff measurement area /  $H = 160 \text{ cm}$

### Room dimensions

3.33 x 5.75 m

Ground surface area = 19.14 m<sup>2</sup>

Room height = 3.45 m

### MEDI Lux – what is the biological requirement for vertical illuminance on a patient's eye?

MEDI Lux is the melanopic and weighted daylight-equivalent illuminance. According to DINT/S 67600, 250 MEDI Lux (Melanopic Equivalent Daylight Illuminance) must be present vertically on the eye for a number of hours in order to achieve the required biological effect.

How is this converted to visual lux? In our example 4000 K is assumed with an MDER of 0.836. The 250 MEDI Lux value is divided by the melanopic, daylight-equivalent response factor of  $MDER = 0.68$

$[250 / 0.836 = 299 \text{ lx}]$ . This 299 lx is the biologically necessary vertical illuminance for a 32-year-old observer.

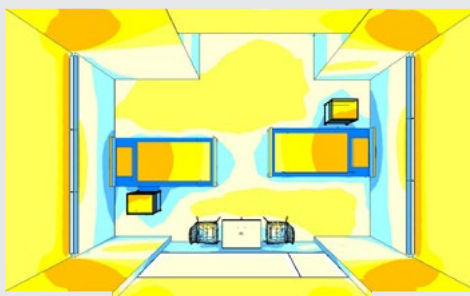
DINT/S 5031-100 lists important age-specific correction factors. For a 50-year-old observer, this results in a vertical illuminance of 450 lx  $[299 \text{ lx} / 0.664 = 450 \text{ lx}]$ .

The age-specific correction factors for a 75-year-old observer result in a factor of 0.319 – this gives a vertical illuminance of 937 lx  $[299 \text{ lx} / 0.319 = 937 \text{ lx}]$ .

This means that in our planning example for a biologically and functionally ideally illuminated patient room, an appropriate vertical illuminance is given for a 75-year-old observer.

# VITA MED

## Examination light (direct 100%/indirect 100%)



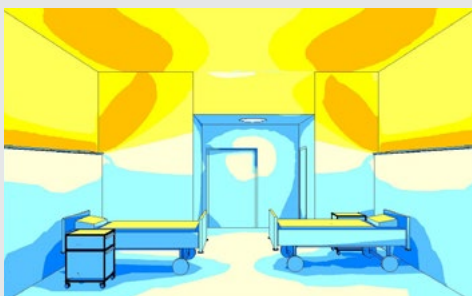
100 250 500 750 1000 1500 2000 [lx]

Number	Luminaires	Light output
2	Direct module 100 cm / 7200lm	100%
4	Indirect module 100 cm / 7200lm	100%
2	Indirect module 120 cm / 8640 lm	100%

Measurement area	Standard specification $E_m / U_0$	Light output $E_m / U_0$
<b>General lighting (H=0.85 m)</b>	100 - 200lx	1750lx / 0.7
<b>1 Floor</b>	100 - 200lx / 0.4 - 0.6	1400lx / 0.6
<b>2 Ceiling</b>	30 - 100lx / 0.1	1850lx / 0.7
<b>3 Walls (Ø all walls)</b>	50 - 150lx / 0.1	≥ 700lx / 0.6
<b>4 Level of examination:</b>		
basic examination	300 - 500lx / 0.6	2300lx / 0.65
examination & treatment	1000 - 1500lx / 0.7	2300lx / 0.65
<b>5 Reading range</b>	300 - 750 lx / 0.7	2500lx / 0.9
	<b>Standard specification <math>E_z / U_0</math></b>	<b>Light output <math>E_z / U_0</math></b>
<b>6 Field of vision patient lying:</b>		
for communication:	150 lx / 0.1	1700lx / 0.9
biologically effective for:	technical specification (DINT/S 67600/5031-100)	
50-year-old observer	≥ 450 lx / 0.1	1700lx / 0.9
75-year-old observer	≥ 937 lx / 0.1	1700lx / 0.9
<b>7 Staff standing (1.6 m):</b>		
basic examination	100 lx / 0.1	900lx / 0.7
examination & treatment	150lx / 0.1	900lx / 0.7
biologically effective		
for 50-year-old nursing staff	≥ 450 lx / 0.1	900lx / 0.7

# VITA MED

## General room light (indirect 100%)



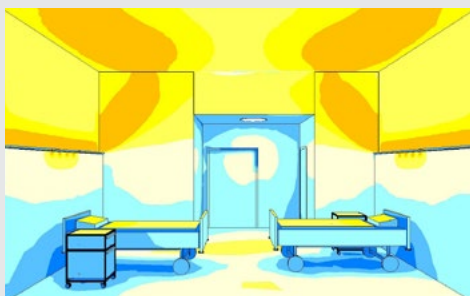
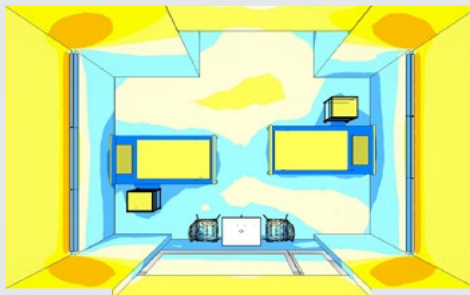
100 250 500 750 1000 1500 2000 [lx]

Number	Luminaires	Light output
2	Direct module 100 cm / 7200 lm	off
4	Indirect module 100 cm / 7200 lm	100 %
2	Indirect module 120 cm / 8640 lm	100 %

Measurement area	Standard specification $E_m / U_o$	Light output $E_m / U_o$
<b>General lighting (H=0.85 m)</b>	100-200 lx	1100 lx / 0.9
① <b>Floor</b>	100-200 lx / 0.4-0.6	900 lx / 0.8
② <b>Ceiling</b>	30-100 lx / 0.1	1700 lx / 0.65
③ <b>Walls (Ø all walls)</b>	50-150 lx / 0.1	≥500 lx / 0.6
④ <b>Level of examination:</b>		
basic examination	300-500 lx / 0.6	1150 lx / 0.9
examination & treatment	1000-1500 lx / 0.7	1150 lx / 0.9
⑤ <b>Reading range</b>	300-750 lx / 0.7	750 lx / 0.9
	<b>Standard specification <math>E_z / U_o</math></b>	<b>Light output <math>E_z / U_o</math></b>
⑥ <b>Field of vision patient lying:</b>		
for communication:	150 lx / 0.1	1100 lx / 0.95
biologically effective for:	technical specification (DINT/S 67600/5031-100)	
50-year-old observer	≥450 lx / 0.1	1100 lx / 0.95
⑦ <b>Staff standing (1.6 m):</b>		
basic examination	100 lx / 0.1	750 lx / 0.7
examination & treatment	150 lx / 0.1	750 lx / 0.7
biologically effective for 50-year-old nursing staff	≥450 lx / 0.1	750 lx / 0.7

# VITA MED

## General room & reading light (direct 30% / indirect 100%)



100 250 500 750 1000 1500 2000 [lx]

Number	Luminaires	Light output
2	Direct module 100 cm 7200lm	30%
2	Indirect module 100 cm 7200lm	100%

Measurement area	Standard specification $E_m / U_0$	Light output $E_m / U_0$
<b>General lighting (H=0.85 m)</b>	100-200lx	1300lx / 0.8
① <b>Floor</b>	100-200lx / 0.4-0.6	1050lx / 0.7
② <b>Ceiling</b>	30-100lx / 0.1	1700lx / 0.7
③ <b>Walls (Ø all walls)</b>	50-150lx / 0.1	≥500lx / 0.6
④ <b>Level of examination:</b> basic examination	300-500lx / 0.6	≥1500lx / 0.85
⑤ <b>Reading range</b>	300-750 lx / 0.7	≥1350lx / 0.9
	Standard specification $E_z / U_0$	Light output $E_z / U_0$
⑥ <b>Field of vision patient lying:</b> for communication:	150lx / 0.1	≥1250lx / 0.95
biologically effective for:	technical specification (DINT/S 67600/5031-100)	
50-year-old observer	≥450lx / 0.1	≥1250lx / 0.95
⑦ <b>Staff standing (1.6m):</b> basic examination	100lx / 0.1	750lx / 0.7
examination & treatment	150lx / 0.1	750lx / 0.7