# The contribution of flooring to reduce maintenance costs and the use of chemicals in hospitals

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# Study on Healthy and Sustainable Flooring by Health Care Without Harm


"The ideal resilient flooring is non-toxic throughout its life cycle, practical (hygienic and easy to clean), durable, safe, silent underfoot, visually pleasant and cost-effective."

# Practical experience

- Hazardous and toxic chemicals
- Indoor air pollution
- Underfoot comfort
- Installation problems
- Expensive and difficult cleaning
- Life Cycle Costs

**“The cheapest product turns out to be the most expensive option over life time”**

# US Group Kaiser Permanente Replacing PVC by rubber

Bird's Eye View | Checklists | Credit Language | Resources

## Explore alternatives to harmful products

***Note: This pilot credit was closed for new registrations as of March 1, 2012.***

The PBT Source Reduction pilot credit encourages project teams to explore alternatives to building products and materials that may contain ingredients that have a harmful effect on human health. The credit specifically promotes alternatives assessment and avoidance of building products which contain certain halogenated compounds.

*The Kaiser rehabilitation center in Vallejo, California, uses Nora rubber flooring, which Kaiser adopted as its standard in 2004, replacing VCT. Nora flooring contains no PVC, plasticizers, or halogenated compounds, requires no maintenance coatings, is Greenguard certified, and is less slippery than VCT, potentially reducing patient falls.*

Photo – Kaiser Permanente

## Chemicals of concern

Most of the chemicals and compounds listed in the PBT Source Reduction pilot credit have been identified by the U.S. EPA as chemicals of concern. Project teams are encouraged to evaluate product alternatives and request specific information regarding use of chemical compounds listed in the credit from manufacturers.

# Products' surfaces and their impact on cleaning and maintenance

# Cleaning & Maintenance

Linoleum surface 1:500

Rubber surface, 1:500

PVC surface 1:500

Source: Dr. Jürgen Schmiegel, Piepenbrock (Facility Management Company /Germany); April 2011

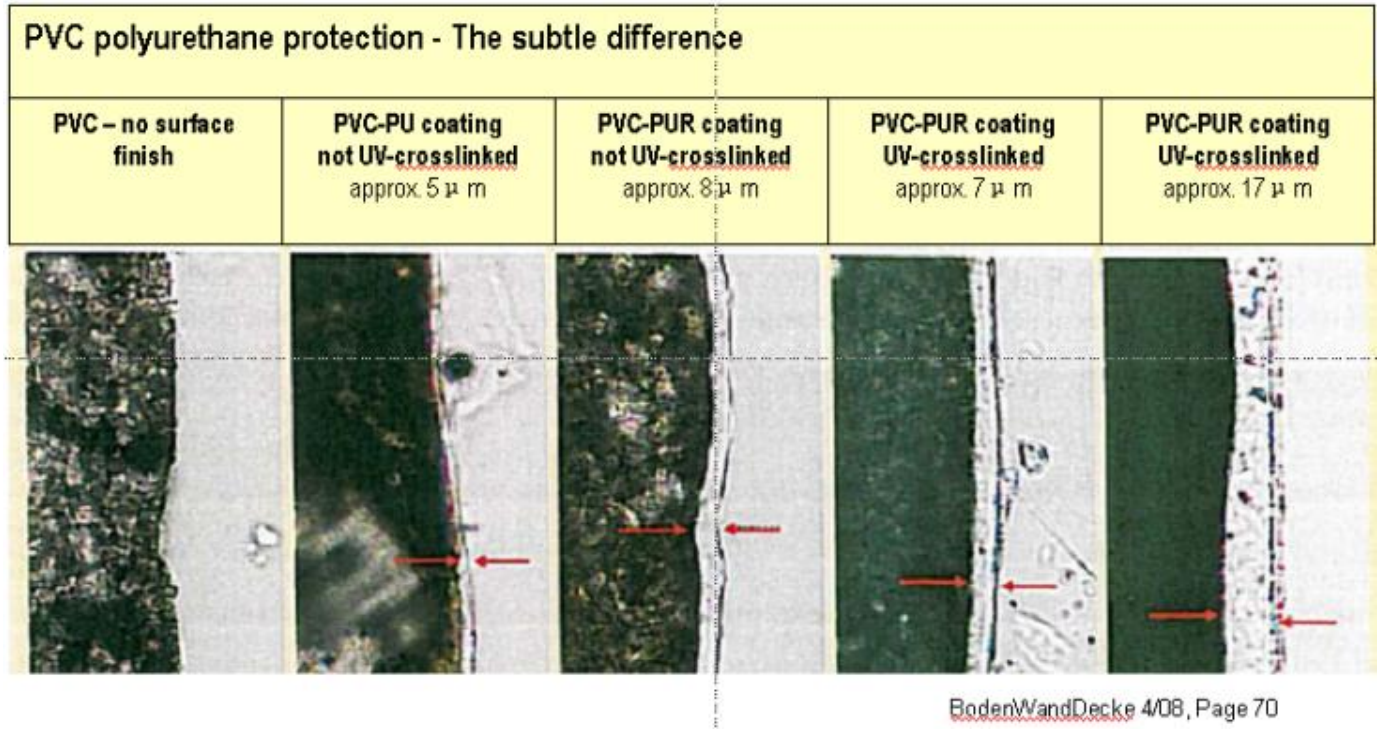
# Traditional floorings require stripping and coating

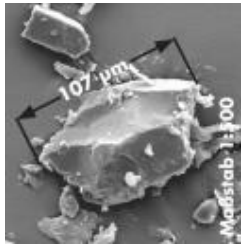
Stripping and coating means using highly alkaline chemicals to remove old coatings and to apply a new layer of coating afterwards.

This process is repeated regularly and requires

- interruption of use of the rooms for at least 24 hours
- aggressive chemicals that cause disposal problems
- high cleaning and maintenance budgets

# “Permanent” surface protections

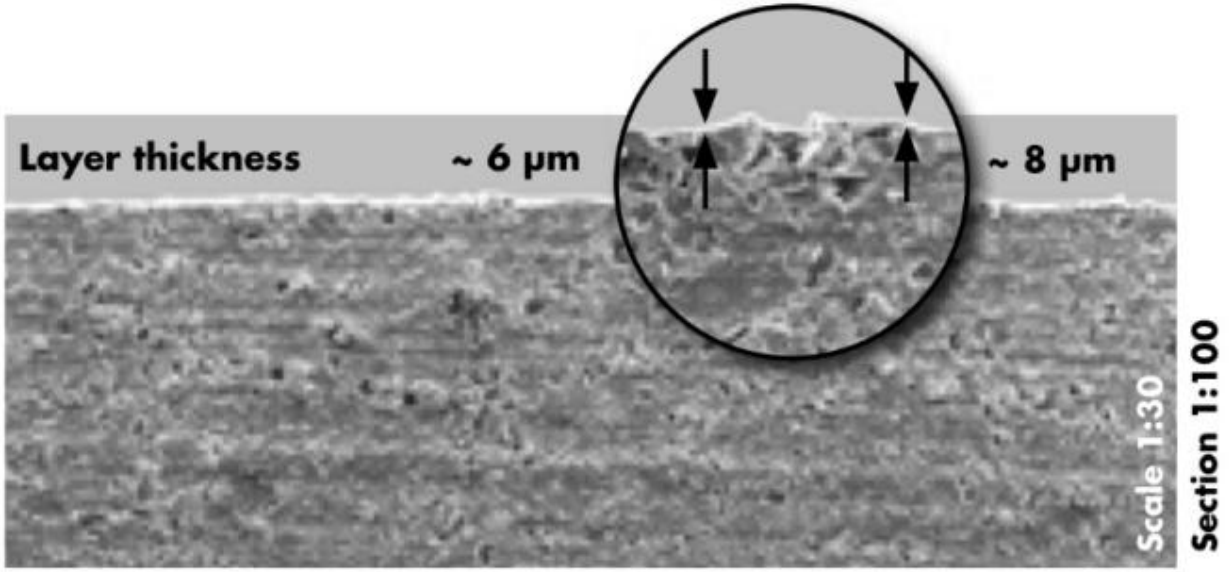



**The actual “use-surface” is limited to only a few thousandth millimetres (e.g. 5*µ*m= five thousandth mm on 2000*µ* = 2mm floorcovering, a little stone form the shoe sole 107*µ*m.)**

# “Permanent” surface protections

**PU surfaces only have a thickness of a few micrometres (1 µm = $\frac{1}{1000}$ mm) and a limited life.**




**Cross-section PVC with PU surface**

# Typical damages

Surface protections cracking or worn off ….

# Diamond pad cleaning (nora pads)


A chemical free cleaning method that requires only water

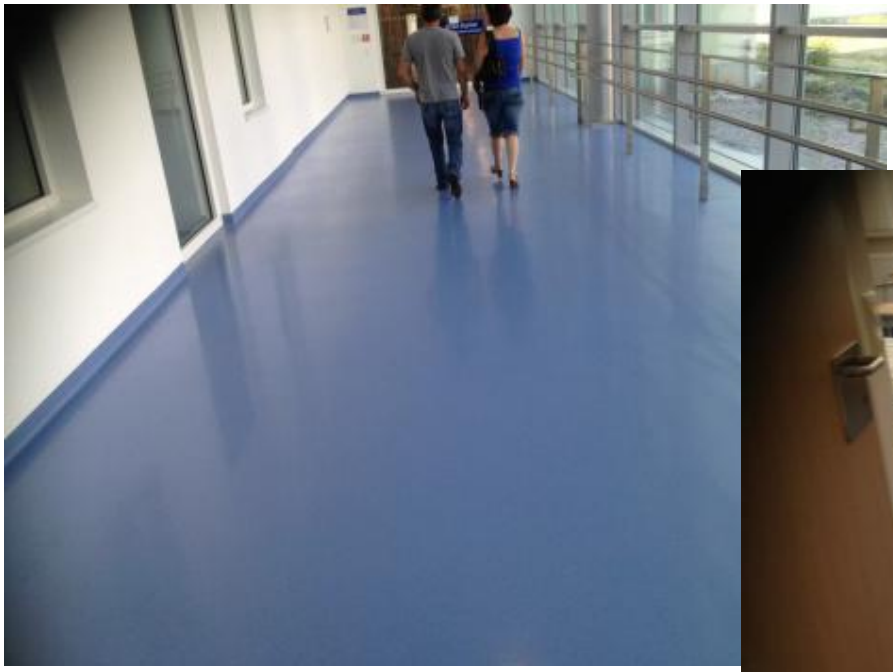
Suitable for all cleaning machines

Can be combined with manual mopping and disinfection methods

Developed originally for ceramic floor and specifically adapted for nora rubber floors (not suitable on coated or porous floor surfaces)

# Diamond Pad Cleaning in LNK Linz

Since May 2013 this hospital is maintaining the new rubber floors nearly without chemicals!



# Cleaning a 12 year old rubber floor – only with water

This floor was never stripped before

# Rehazentrum Judenburg Straßengel, Austria

*noraplan plus 8 years old, surface before cleaning*

*noraplan plus 8 years old, surface after cleaning*

# Rehazentrum Judenburg Straßengel

*Buffing with nora Pad 1*


LKH Judenburg
Without chemicals


LKH Judenburg
Mat without chemicals

## Table 2: Evaluation criteria for PVC, linoleum and rubber resilient flooring

| CRITERIA | PVC | LINOLEUM | RUBBER |
|---|---|---|---|
| Manufactured without hazardous chemicals | impossible | possible | possible |
| Free from indoor air pollution problems | no | some | partially or yes |
| Free from pollutants that may interfere with product recycling | no | some | partially or yes |
| Free from plasticisers | no | yes | yes |
| Free from halogenated organic compounds | no | yes | partially or yes |
| Hygiene potential | high | medium | high |
| Life cycle cost | medium – high (depending on quality) | high | low |
| Maintenance | manageable | manageable | easy with high quality flooring products only |
| Slip resistant | yes | yes | yes |
| Good acoustics | no | limited | yes |
| Comfortable | less so | yes | yes |
| Free from glare | dependent on surface treatment | dependent on surface treatment | yes |
| High quality eco-certified product available | no | yes | yes |
| Recommended? | no | yes, in particular situations and conditions and if it carries suitable eco-certification | yes, if quality is high and it carries suitable eco-certification |

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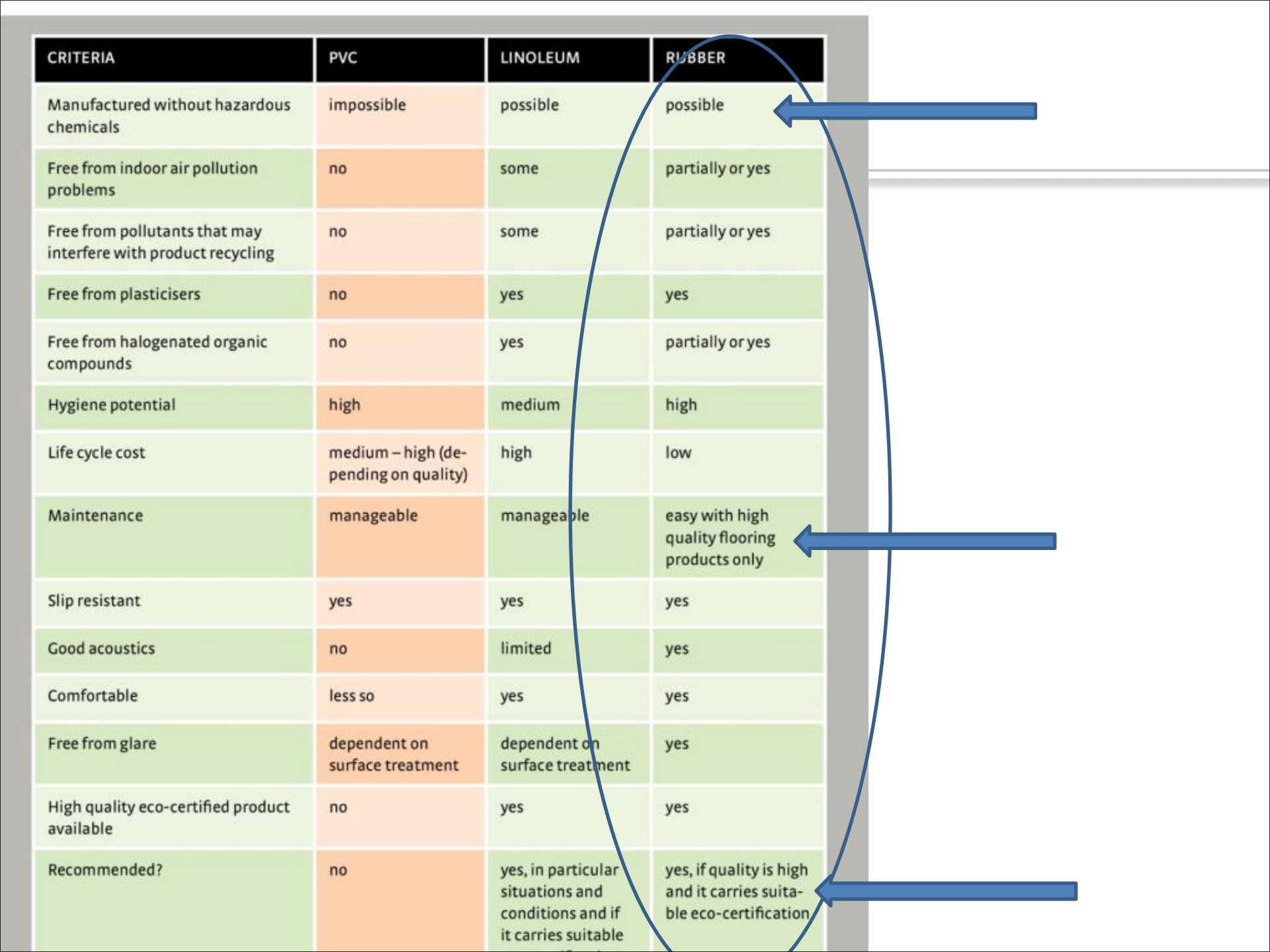
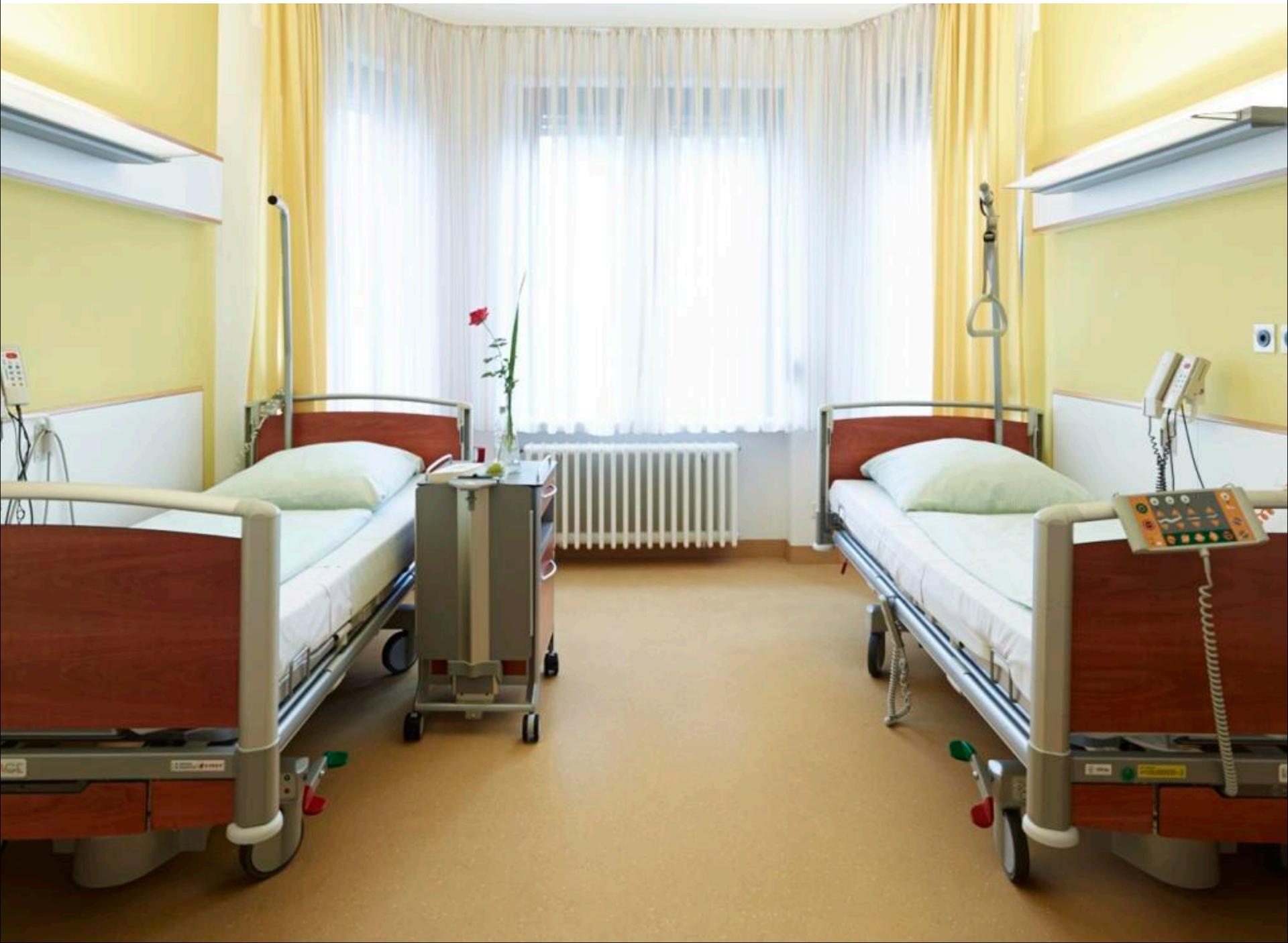



Wartebereich Frauenklinik
Waiting Area women's clinic
3 OG
Family
Lounge




References UK:
Evelina Children Hospital, London

Werneth Primary Care Center,
Oldham


New Cross Hospital
Wolverhampton, UK