SYNOPSIS

# KEY POINT SUMMARY

## OBJECTIVES

The objective of this paper was to present the considerations for planning a cardiovascular hybrid OR to make a case for incorporating angiographic imaging capabilities in the hybrid OR.

# Planning a cardiovascular hybrid operating room: The technical point of view

Nollert, G., & Wich, S. 2009 | *The Heart Surgery Forum*. Volume 12, Issue 3, Pages 119-124

## Key Concepts/Context

The authors allude to the growing trend of using hybrid operating rooms (ORs) for a wide range of cardiac surgeries and interventions. Given the complexity of the work environment, the authors emphasize the need for integrating clinical, technical, and architectural knowledge and expertise into the design of a hybrid OR. They also emphasize the need for angiographic imaging capabilities in the OR in addition to other interventional technologies. In this paper they present their recommendations.

## Methods

The authors do not indicate the methodology involved in the data gathering for this paper. However, it is seen that they have drawn information and data from existing literature and research on the matter.

## Findings

The following were the recommendations, pertaining to the physical environment of a hybrid OR, made by the authors:

Location of the hybrid OR:

- The ideal location for hybrid ORs is next to interventional suites and ORs.
- If the above situation is not possible, the hybrid OR should be designed next to other ORs. This ensures ready access to OR equipment, personnel, anesthesia, and intensive care.

Room size and preparation:

- Hybrid ORs should be larger than standard ORs – 70 m2 is the recommended optimal dimension, so as to accommodate the following:
    - Imaging equipment
    - The large team size (typically 8 – 20 personnel)
- There should be space for a control room and a technical room.
- Washing and prep rooms
- Together, OR, control, technical, wash, and prep rooms would have a total area of at least 150 m2
- Having a fixed C-arm in the OR would entail:
    - A minimum OR size of 45 m2
    - Lead shielding of 2-3 mm
    - Ceiling or floor reinforced to carry a weight of 650-1800 kg

Lights, monitors, and other devices:

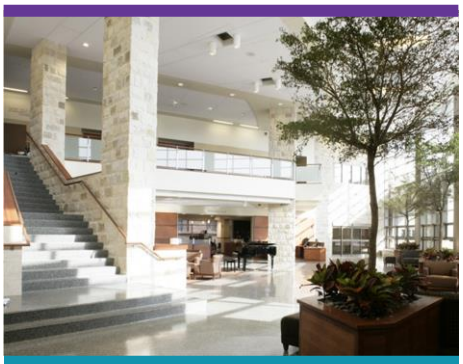
- Multiple mobile and flexible booms are needed in the hybrid OR. But if two booms are being installed, one should be placed on either side of the OR table.
- It should be ensured that ceiling-mounted displays and equipment do not obstruct operating lights.
- Ceiling-integrated theater lights (with remote control capability) should be incorporated in place of conventional surgical lights, as the latter may not be compatible with imaging equipment.

Hygiene:

- Ceiling-mounted airflow systems above the operating table are not recommended, as cleaning these can be difficult.

Imaging Equipment:

The authors also make recommendations regarding the use of fixed versus mobile, ceiling- versus floor- mounted, mono- versus biplane imaging systems, operating tables, and the incorporation of new imaging methods and techniques in the hybrid OR.



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## Limitations

The authors do not list any limitations for their study. It may be noted that these are recommendations and not findings from an empirical study.

## Design Implications

- This study recommends that hybrid ORs should:
- Be located next to interventional suites and ORs or to other ORs.
- Be larger than standard ORs – an optimal area of 70 square meters.
- Have control, technical, washing and prep rooms – a total area of 150 square meters.
- Utilize a lead shielding of 2-3mm and the ceiling or floor should be reinforced to carry a weight of 600-1800 kg for a fixed C-arm.
- Have multiple mobile and flexible booms.
- Have ceiling-integrated theater lights that are not obstructed by other displays/equipment and can be remotely controlled.
- Not have ceiling-mounted airflow systems.

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