Guideline for design and maintenance of the surgical suite.

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Association of periOperative Registered Nurses (AORN)

Miner M, Peery D. Guideline for design and maintenance of the surgical suite. In: 2024 guidelines for perioperative practice. Denver (CO): Association of periOperative Registered Nurses (AORN); 2023 Jul 20. pp. 79-142. [236 references]

View Original Guideline

Overview

Guideline Objective

To provide guidance on the design layout and equipment used in the surgical suite and maintenance of these spaces, as well as recommendations for functionality, energy and cost efficiency, workflow, and emergency measures; physical security measures; considerations and safety measures for new construction or renovation of the surgical suite; planning for unintended utility service interruptions; restoration of the surgical suite to full functionality; maintenance of structural surfaces; and the design, monitoring, and maintenance of the heating, ventilation, and air conditioning (HVAC) system

Patient Population

Any patient undergoing operative or other invasive procedures

Recommendations

Recommendation Statements

Note: Guidance is provided for one recommendation statement under each topic. Refer to the original guideline for additional recommendations.

Interdisciplinary Team

1.1. Convene an interdisciplinary team with authority and responsibility to provide oversight of construction and renovation projects in the perioperative area. (**Recommendation**)

Planning

2.1. New construction and renovation projects in perioperative areas must be compliant with applicable local, state, and federal regulations. (**Regulatory Requirement**)

Designing and Surgical Suite

3.1. Design the surgical suite layout, including the activity-based zones and utility and heating, ventilation and air conditioning (HVAC) requirements, based on the allocated space recommendations (refer to Table 2 in the original guideline), location in the facility, and predicted number of patients, to facilitate a safe and ergonomic workflow. (**Recommendation**)

Renovation and Technology Updates

4.1. Determine current and future intentions, space, and technology needs when renovating the perioperative suite. (**Recommendation**)

Construction-related Environmental Contamination

5.1. Based on the infection control risk assessment (ICRA) (refer to Recommendations 2.9 and 2.10 in the original guideline), establish, maintain, and monitor measures for preventing environmental contamination when new construction or renovation projects occur near an occupied area of the health care facility. (**Recommendation**)

Preoperative Area

6.1. Design the preoperative area with staff workflow and patient preference in mind, to include:

- Patient care rooms or areas,
- A medication safety zone,
- Hand washing stations,
- Provisions for storing patients' belongings, and
- Bathrooms for patients and personnel.

(**Recommendation**)

Operating Rooms (ORs)

7.1. Design operating rooms to be of sufficient size to accommodate the number of anticipated personnel and amount of fixed and mobile equipment that may be required in the intended workflow zones. (**Recommendation**)

Hybrid OR

8.1. Perform a risk/benefit/cost analysis during the planning phase to determine whether a hybrid OR (i.e., Class 3 imaging room) will be a part of the surgical suite by

- Identifying the specialties that will use the hybrid OR;
- Identifying what type of imaging system will be used;
- Evaluating OR bed compatibility with the imaging system;
- Identifying the type of procedures (e.g., traditional open procedures, interventional procedures, diagnostic nonsurgical procedures, a combination of procedure types) that will be performed in the hybrid OR; and
- Determining the required safety precautions (e.g., for radiation, magnetic resonance imaging).

(**Recommendation**)

Procedure Rooms

9.1. The surgical suite may include a procedure room. (**Conditional Recommendation**)

Postoperative Areas

10.1. When separate from the preoperative area, use patient healing design to design the postoperative area (i.e., postanesthesia care unit [PACU] Phase I and II), and include

- Patient care stations,
- A medication safety zone,
- Hand washing stations,
- Storage areas for patients' belongings,
- Bathrooms for patients and personnel,
- A nourishment area for patients in Phase II recovery,
- Ice-making equipment,
- Other support areas (refer to Section 12 in the original guideline).

(**Recommendation**)

Sterile Processing Areas

11.1. When designing the sterile processing department (SPD) or area, determine the

- Anticipated volume of work based on the units to be served;
- Type of distribution system (e.g., vertical, horizontal, case cart, exchange cart, par level, requisition);
- Space requirements for equipment (e.g., trash, linen hampers), specifically for inspection and cleaning verification testing (e.g., sterilizers, washer-disinfectors, washer-decontaminators, single-or multi-chamber tunnel washers, cart washers, ultrasonic cleaners, automated endoscope processors, detergent management system);
- Space and equipment requirements for processing reusable textiles (e.g., receiving, transporting, collecting, storing);

- HVAC and other utility requirements (e.g., environmental controls and monitoring systems, emergency power supply, location of instrument air, water quality, communication systems, data lines and power for computers, lighting);
- Utilities required (e.g., lighting, steam supply, internal and external communication, information systems, water purification, instrument air);
- Storage requirements (e.g., patient care equipment, packaging material supplies, sterilization process, indicators, case carts, sterilizer carts);
- Space and equipment requirements for management of infectious waste, hazardous waste, and recyclable materials;
- Security systems;
- Support areas if not shared with other portions of the surgical suite;
- Space for receipt and return of loaned instruments, supplies, and devices;
- Provisions for off-site transportation logistics (e.g., staging areas for instruments and medical devices that are transported between facilities for processing); and
- One-way workflows and other traffic patterns.

(**Recommendation**)

Support Areas

12.1. Locate surgical suite support areas adjacent to patient care areas, to include

- Locker rooms;
- The nurse station;
- Clean equipment storage areas, which may be combined with or separate from clean or sterile supply storage areas, and a clean linen storage area;
- An environmental services room;
- A supply breakout area/room;
- A sterile processing department;
- Administrative areas (e.g., reception area, business offices);
- Anesthesia workrooms and supply storage;

- Space for work breaks;
- A soiled workroom, which may be combined with or separate from a garbage storage/holding area; and
- A soiled linen storage area.

(**Recommendation**)

OR Maintenance

13.1. Develop and implement a systematic process for monitoring and maintaining the surgical suite, including the infrastructure, equipment, and updates (e.g., technology, HVAC, surfaces). (**Recommendation**)

Utility and HVAC Disruption

14.1. Develop and implement a plan for managing and restoring the utilities and repairing damage to the surgical suite after failure of an internal or external utility. (**Recommendation**)

Evidence Rating Scheme

AORN Hierarchy of Evidence

Research	I	• Systematic review — all studies randomized controlled trials (RCTs) • RCT
	II	• Systematic review — all studies quasi-experimental or a combination of RCTs and quasi-experimental • Quasi-experimental
	III	• Systematic review — all studies non-experimental or a combination of RCTs, quasi-experimental or a combination of

		RCTs and quasi-experimental and non-experimental; any or all studies qualitative • Non-experimental • Qualitative
Non-research	IV	• Clinical practice guideline • Consensus or position statement
	V	• Literature review • Case reports • Expert opinion • Organizational experience

AORN Evidence Rating Model

	High	**Moderate**	**Low**
Evidence Rating	IA or IB IIA or IIB	IIIA or IIIB	IC, IIC, or IIIC VA, VB, or VC
	• Wide range of studies with no major limitations • Little variation between studies	• Few studies and some have limitations but not major flaws • Some variation between studies	• Studies have major flaws or there are no rigorous studies • Important variation between studies

Recommendation Rating Scheme

Recommendation Rating

Recommendation

- Benefits clearly exceed harms
- Supported by high- to moderate-quality evidence
- May be based on low-quality evidence or expert opinion when
    - High-quality evidence is impossible to obtain
    - Supported by a guideline, position statement, or consensus statement

Conditional Recommendation

- Benefits are likely to exceed harms
- May be supported by any level of evidence when
    - Indicated for a specific patient population or clinical situation
    - Impact of the intervention is difficult to separate from other simultaneously implemented interventions (e.g., "bundled" practices)
    - Benefit-harm assessment may change with further research or not be consistent
    - Benefit is most likely if used as a supplemental measure

No Recommendation

- There is both a lack of evidence and an unclear balance between benefits and harms.

Implementation

Regulatory Requirement

- Perioperative team members "must" implement the recommendation in accordance with regulatory requirements.

Recommendation

- Perioperative team members "should" implement the recommendation, unless a clear and compelling rationale for an alternative approach is present.

Conditional Recommendation

- Perioperative team members "may" implement the recommendation.
- The degree of implementation may vary depending on the benefit-harm assessment for the specific setting.

No Recommendation

- Perioperative team members will need to evaluate whether or not to implement the practice issue.

Related Content

Supporting Documents

- AORN Guideline for Design and Maintenance of the Surgical Suite Evidence Table; 2022.
- Guideline for Design and Maintenance of the Surgical Suite Evidence Review and PRISMA 2020; 2024 Jan 31.
- AORN Evidence Rating Model; 2019.
- AORN Hierarchy of Evidence; 2015.
- AORN Non-research Evidence Appraisal Tool; 2015.
- AORN Research Evidence Appraisal Tool — Study; 2015.

- AORN Research Evidence Appraisal Tool — Summary; 2015.
- AORN Evidence Appraisal Companion Guide and Definitions.

Implementation Tools

- Infographic: How an AORN Guideline is Created.
- Guideline Essentials.
- Clinical Resources.

Patient Education

No patient education materials available.

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TRUST Scorecard

Composition of Guideline Development Group (GDG)

Multidisciplinary GDG Members	**Yes**
Methodologist Involvement	**Yes**
Incorporation of Patient and Public Perspective	

Systematic Review of Evidence

Literature Search	
Study Selection	
Evidence Synthesis	

Foundations for Recommendations

Strength of Evidence Grade	
Description of Benefits and Harms of Recommendations	
Summary of Evidence Supporting Recommendations	
Strength of Recommendations Rating	
Clear Articulation of Recommendations	

Funding Source

Yes

Disclosure and Management of Financial Conflicts of Interests



External Review



Updating



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