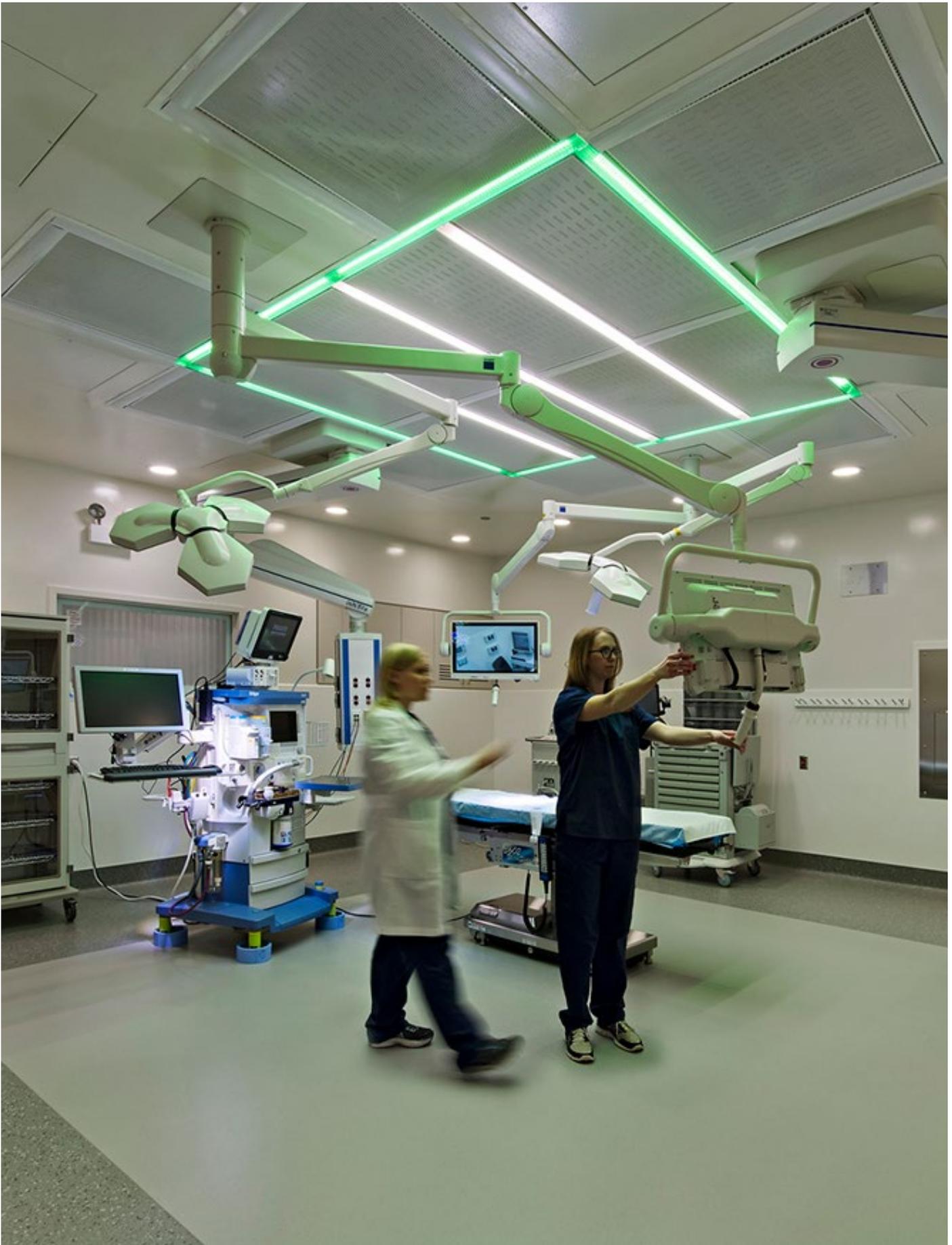


HEALTH PERSPECTIVES

**POST-OCCUPANCY
EVALUATIONS**

SMITHGROUP



POST-OCCUPANCY EVALUATIONS AS A LEARNING TOOL

Post-occupancy evaluation studies (POE) originated in the United Kingdom in the 1960s as a method to assess and document how buildings are being used and whether they met the original design intent. Although there was some initial interest in the U.S., until recently there was very little enthusiasm for an organized framework to evaluate a project's successes or failures.

The reasons for the POEs unpopularity in the U.S. include the time and cost associated with conducting them, a fear of questioning the design work, and a lack of an agreed-upon process or metrics. However, with the recent focus on research in design and integrating evidence-based design into the building solution, the POE has become a critical part of the feedback loop in the process.

Wolfgang Preiser, Ph.D., an early proponent and author of numerous studies on POEs, defined the POE as "the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time."

There are numerous reasons why both clients and architects have become supportive of the POE process. From the client's perspective, a post-occupancy study:

- Informs them if their goals for a particular project have been achieved and, if not, provide them with information as to why not.
- Provides input into the organization's strategic and financial plan, so a data-driven method of evaluating facilities can support future decision-making.

From the architect's perspective, a POE provides:

- A method of evaluating evidence-based design strategies that have been incorporated into the design.
- An organized method to develop metrics and document lessons learned.

- Input into an internal or external database to provide a knowledge-base for the architectural practice to enhance services to future clients.

TYPES OF POES

There are three types of POEs, each of which has a different purpose and is conducted in a different timeframe. For healthcare projects, the most common approach is a performance POE completed approximately one year after occupancy, which may be focused on the functional components (e.g., patient and staff flow, clinical utilization of rooms, medical equipment placement), the technical components (e.g., energy use, lighting, water usage), or both.

Post-Occupancy Evaluations

Type of POE	Performed (time after facility completion)	Purpose
Process	3 Months	Evaluates planning, design and construction process and identifies immediate issues
Performance	9 to 18 Months	In-depth review of functional and/or technical performance of the space
Strategic	3 to 5 Years	Documents how the space is being used and how the building will fit into the strategic master plan

POE LEVEL OF INVESTIGATION

The depth and level of effort of the POE can also vary and depend on the goals of the evaluation and the amount of investment. Typically, the initial POE process starts with the indicative level of effort (illustrated below). This process can transition into more involved POEs requiring a deeper level of study and possibly involving the use of POE specialists.

The indicative POE should be supplemented with a continuous POE in which a database of POE findings is developed to serve as a knowledge-base to inform future projects of a similar type.

INDICATIVE POE PROCESS

POE Level of Investigation	Time Required	Forms of Evaluation	Methods Used
Indicative	1–2 Days	Summary of major strengths and challenges of the buildings performance	Analysis of metrics Structured interviews Facility tour
Investigative	One or more months	Provides a thorough understanding of the causes and effects associated with the building's performance	Additional methods: Literature review Questionnaires Focus groups
Diagnostic	Several months	Provides a correlation of physical and behavioral measures with subjective occupant responses	Academic level of rigor: Facility observations In-depth interviews Pt/staff questionnaires Pt/staff observations Focus groups Technical measurements
Continuous POE	Minimal and ongoing	Incorporation of metrics and findings into a database	Internal or external databases

The goals of the POE process are to provide useful feedback to clients regarding the achievement of their goals and to provide a database to facilitate continual improvement of the services offered by the architectural and engineering firm. To that end, the process must be:

- **Valid.** Focuses on measurable metrics and avoids conclusions affected by variables that weren't controlled or can't be controlled.
- **Affordable.** Recognizes a realistic amount of time that the firm and the client are willing to devote to the initial POE analysis but is organized to support deeper levels of analysis.
- **Valuable.** Provides valid quantitative and qualitative information to the client on the achievement of the project goals and generates accurate information for the firm's knowledge base.

THE INDICATIVE POE PROCESS

To achieve these goals, a functional post-occupancy evaluation should be completed 12 to 18 months after the facility is occupied, using an indicative POE approach. The suggested steps in the process are:

- **Step One: Pre-POE Planning.** At the inception of the project, the planning and design team will work with the client to determine the project goals and the quantifiable and qualitative metrics that will be used to define success.
- **Step Two: POE Planning.** After the facility has been occupied for a minimum of 12 months, a team member will contact the client to schedule a facility tour to observe how the facility is being utilized, as well as schedule interviews with key members of the client planning team. In addition, updated metrics, as defined in the project goals, will be collected.
- **Step Three: POE Interviews.** One to two planning and design team members will conduct interviews with client planning team participants with a focus on what works well, any unexpected changes in the organization, and what does not work as expected.
- **Step Four: Facility Tour.** The planning and design team members will conduct a facility walk-through to observe how space is being used and if the operational systems defined in the planning have been implemented, and to validate issues reported in the interviews.
- **Step Five: Summarize Results.** The POE team will document the POE findings and share them with the client, firm team members, and other interested colleagues.
- **Step Six: Input Metric Data into Firm Database.** Finally, the findings from the POE will be input into the firm database to create a baseline of information for future projects.

CASE STUDY:

A PROTOTYPE FOR AN INDICATIVE POE OF AN EMERGENCY DEPARTMENT

THE FOLLOWING CASE STUDY ILLUSTRATES HOW THE INDICATIVE POE PROCESS WAS USED WITH A CLIENT APPROXIMATELY ONE YEAR AFTER COMPLETION OF A LARGE EMERGENCY ROOM (ED) RENOVATION AND ADDITION.

Background: The fundamental problem faced by this ED was inadequately-sized patient care treatment bays, most of which were multiple occupancy. In addition, the overall size of the department did not provide enough ancillary space to support the number of treatment bays. As a result of the capacity and space challenges that the department faced, their project goals were to provide:

- An adequate number of treatment bays to accommodate 1,200 to 1,400 visits per treatment bay.
- All private rooms or bays.
- An increase in the overall space allocation per bay to between 600 and 650 DGSF per treatment bay to ensure the appropriate amount of clinical and support space was provided.

Post-Occupancy Evaluation Summary: After the replacement ED had been occupied for approximately one year, a meeting was scheduled to complete a post-occupancy interview and tour the facility. A summary of the key findings included:

- **Analysis of Metrics.** The projected volume of patient visits did not increase as expected due to several changes within the organization. As a result, the number of visits per treatment bay was slightly less than the low end of the range: 1,130 visits per bay per year. The plan successfully provided all private

treatment rooms or three-sided bays. The space allocation per bay, 630 DGSF, was within the target range of 600 to 650 DGSF/bay.

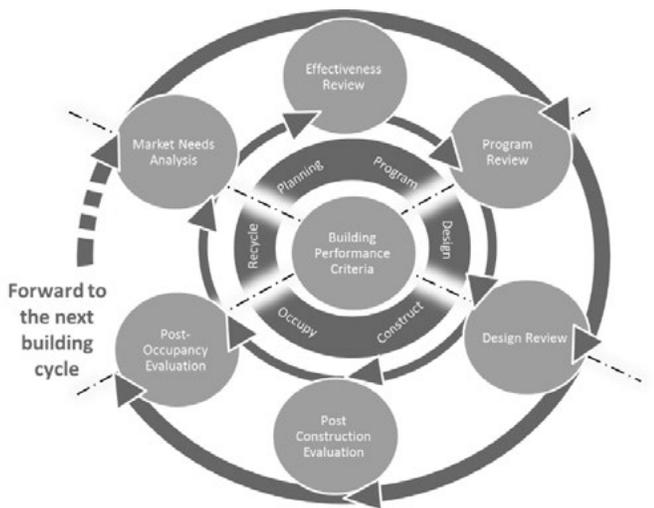
- **Interviews.** A structured interview was completed with the ED's physician director that led the ED planning team. He was supportive of the POE process and gathered input from nurses and physician colleagues before the meeting. Some of the significant comments shared included:
 - Patient volume increased slower than expected but the flexible design of the department allowed them to reconfigure the teams to maintain an efficient staffing pattern.
 - The nurses stated they would have preferred a more centralized nurse station with a view of all patients and have had trouble understanding how this concept would be difficult to implement with an increase from 54 open bays to 94 private treatment bays.
 - The results waiting area was not used as anticipated as there is an adequate number of treatment bays to allow patients to remain in place. Consequently, the results waiting area is in the process of being converted into a behavioral medicine holding area as admitting protocols had lengthened the amount of time these patients were held in the ED.



Facility Tour. A walk-through of the department was conducted to verify planned operating systems were functioning, spaces were being used as expected, and the installed equipment was operational. Although there were numerous comments on likes and dislikes, the following is a sampling of the issues identified:

- The two procedure bays were not utilized as the treatment bays in the ED were large enough for procedures and staff preferred to avoid moving patients.
- The large booms in the trauma/resuscitation rooms were cumbersome and used much less than expected.
- Three of the six triage rooms were not utilized and were converted to offices.

The complete findings of the POE process were summarized and shared with the client and project team. To provide an ongoing resource to support future clients, the findings were integrated into a firm database.



Building Performance Evaluation (BPE): Integrative Framework for Building Delivery/Lifecycle Wolfgang Preiser, Jacqueline Visser, and Jay Youss

In conclusion, both the client and project team found the POE process helpful and valuable. As the process is refined and becomes more commonly utilized, the scope of the POE process may expand into more detailed studies, and participation in external databases may be pursued.

In the future, it is anticipated that the healthcare design industry will adopt Preiser’s vision for a Building Performance Evaluation. This approach does not just consist of a post-occupancy evaluation at the end of construction but includes assessments completed at each phase of building development. This allows the progress toward achieving the stated goals to be assessed and adjusted, ensuring that each phase meets the identified performance criteria.

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