



The Role of the Pulmonary Embolism Response Team: How to Build One, Who to Include, Scenarios, Organization, and Algorithms

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Pulmonary embolism response teams (PERTs) are multidisciplinary response teams aimed at delivering a range of diagnostic and therapeutic modalities to patients with pulmonary embolism. These teams have gained traction on a national scale. However, despite sharing a common goal, individual PERT programs are quite individualized—varying in their methods of operation, team structures, and practice patterns. The tendency of such response teams is to become intensely structured, algorithmic, and inflexible. However, in their current form, PERT programs are quite the opposite. They are being creatively customized to meet the needs of the individual institution based on available resources, skills, personnel, and institutional goals. After a review of the essential core elements needed to create and operate a PERT team in any form, this article will discuss the more flexible feature development of the nascent PERT team. These include team planning, member composition, operational structure, benchmarking, market analysis, and rudimentary financial operations.

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Introduction

Pulmonary embolism response teams (PERTs) represent a novel organizational, strategic response to the management of pulmonary embolism (PE). Although a multidisciplinary, acutely available, team concept has been implemented for other complex disease states in the form of trauma teams, stroke teams, and teams treating acute coronary syndromes, the PERT concept represents a

unique variation on this theme. Indeed, stroke, trauma, and acute coronary syndrome teams emphasize the rapid delivery of guideline-based therapies; however, PERT attempts to introduce structure while treating a disease while faced with many clinical unknowns. Thus, whether or not PERT is good for patients or cost-effective, or both is still not known. Nonetheless, the following paragraphs will offer an in-depth overview of forming a PERT under the assumption that the PERT movement drives strategic and organizational efforts to optimize PE care in the form of (1) disease awareness optimization, (2) quality enhancement, (3) clinical benchmark creation, (4) efficiency and cost-containment, and (5) research development.

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PERT Team Composition

Care Providers

Since first implemented in Massachusetts General Hospital in 2011, PERTs have become a national phenomenon with

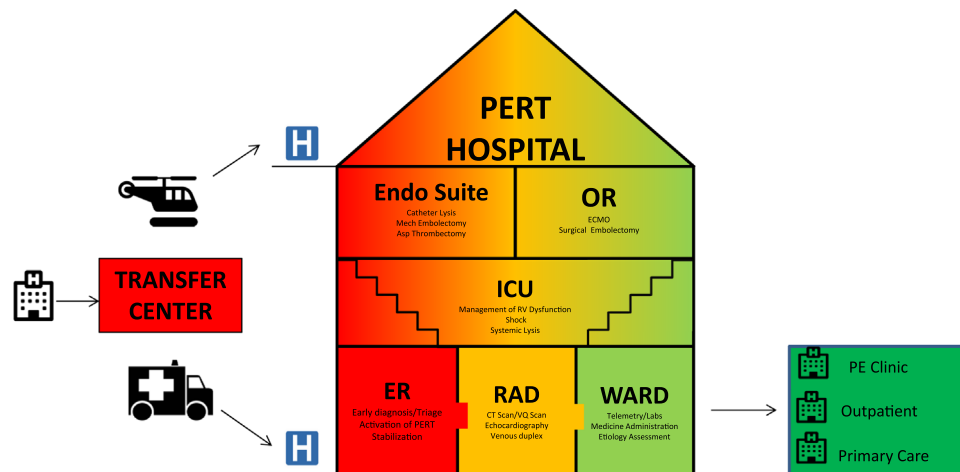


Figure 1 Every PERT should be tailored to the various characteristics of its respective institution. It is useful to visualize the entire PERT process. Identifying the time and place of patient origination, the mechanism of arrival at the hospital, the hospital course, and finally, the location of outpatient follow-up is vital. Defining the role of the PERT at each of these geographic and temporal points will generate a more complete PERT design. (Color version of figure is available online.)

more than 100 teams estimated to be at some stage of formation in the United States. Nonetheless, despite PERT prevalence, there is considerable variation in team composition. Recently published survey data have indicated large disparities in both the number and types of disciplines coalescing to form PE teams.¹ These disparities are noted in both clinical and nonclinical PERT composition. Yet, despite these disparities, no published data exist supporting any single PERT design to be more or less effective than any other.

There are a minimum of 6 clinical roles that need to be filled in a variety of inpatient and outpatient locations. These roles include patient evaluation, triage, stabilization, medical treatment, and potential catheter-based or surgical intervention or both. A variety of disciplines can support each of these functions (Fig. 1). It is not clear whether outcomes are affected by preferring one subspecialty over another (eg, an emergency department physician or internist initially assessing and triaging the patient; or a pulmonologist, intensivist or cardiologist, resuscitating and treating). Only pulmonary artery thrombectomy is limited to a single discipline—cardiothoracic surgery. Thus, with one exception, the array of clinical functions on the PERT revolve depend upon competency, availability, and interest in treating acute PE, and not on the practitioner's discipline of origin.

Team Composition Challenges

PERTs are subject to the same political, interpersonal, competitive, territorial, and other forces that challenge multidisciplinary team formation. Choosing a small, intimate team might foster team efficiency and collegiality at the cost of alienating other potential stakeholders who wish to participate. Conversely, establishing a larger team may be politically expedient and allow all interested parties to feel included. However, the size of such inclusive memberships may introduce inefficiencies that must be

controlled with infrastructure and organizational strategy. Team policies, by-laws, terms of leadership, formal positions, compensation, and methods of expulsion might all need to be instituted for such large teams to be effective.

Starting and Developing a PERT

The size and scope of the initial PERT and process should be based upon the size of the hospital or health system, the clinical volume, the focus on process optimization, the level of research interest and available resources, and existing infrastructure. As demonstrated in the Table, PERT program leadership should focus on (1) initial team building, (2) care location identification, (3) disease awareness, (4) patient identification, and (5) team activation and other processes (eg, follow-up). In later stages, as the PERT stabilizes, volume increases and interest multiplies, there are opportunities for reiteration. The Table suggests different PERT levels. In fact, the boundaries between these stages of growth may be more fluid depending on the hospital, the team and available resources.

In our opinion, constant learning, frequent quality assessments, and ability to change are the hallmarks of the highest level PERT (Fig. 2). Of course, not all teams are interested in, or capable of such processes. As frequent reassessment and reiteration demands huge levels of commitment and time, there are times when more static process for development is appropriate despite the diminished rate of growth or opportunities for program remodeling.

PERT Operational Structure

No matter the level of PERT, programs need to be able to identify patients, activate the team, and offer appropriate care and follow-up:

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