

Article

Designing an Oncology-Oriented Angiographic Suite Within a Dual-Hospital Network: A Context-Specific Pre-Implementation Framework for Interventional Radiology Workflow, Safety, and Quality Governance

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Abstract

Interventional Radiology (IR) is increasingly integrated into multidisciplinary care pathways and requires organizational models capable of coordinating procedural appropriateness, patient safety, professional responsibilities, and resource allocation across hospital networks. This study aimed to develop a context-specific, pre-implementation, document-based organizational framework for the planned activation of an oncology-oriented angiographic suite at the Presidio Ospedaliero “Mons. R. Dimiccoli” of Barletta within the Azienda Sanitaria Locale Barletta–Andria–Trani (ASL BT) dual-hospital network. The framework was developed through structured analysis of institutional planning and governance documents, document-based contextual assessment of the two hospital sites, and systematic translation of identified organizational requirements into structural, procedural, governance, safety, and monitoring components. The model was conceptually organized according to the Structure–Process–Outcome framework and normatively aligned with selected international standards relevant to healthcare quality management, risk management, occupational safety, medical-device-related quality processes, and organizational governance. Its theoretical contribution consists of operationalizing the Structure–Process–Outcome model within the pre-implementation design of a network-based IR service, rather than testing, modifying, or validating the theory itself. The resulting framework differentiates emergency and time-dependent IR activity, maintained at the Andria site, from planned elective oncology-oriented angiographic activity at Barletta. It defines network allocation criteria, procedural scope, governance responsibilities, structural and professional requirements, standardized pre-, intra-, and post-procedural pathways, safety architecture, and prospective quality and performance indicators. No post-implementation clinical or organizational outcomes were evaluated, and the framework has not undergone external validation. It should therefore be interpreted as a context-specific service-design model whose feasibility, performance, and applicability to other healthcare settings require prospective evaluation and local adaptation.



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Keywords: interventional radiology; angiographic suite; healthcare organization; clinical governance; workflow standardization; quality indicators; patient safety; dual-hospital network; oncology pathways; pre-implementation framework; ISO standards

1. Introduction

Interventional Radiology (IR) has progressively evolved from a procedure-based technical discipline into a clinically integrated subspecialty with an established role in minimally invasive diagnosis and treatment across oncologic, vascular, hepatobiliary, urologic, and emergency care pathways [1,2]. Technological advances in angiographic systems, embolization platforms, image-guided ablation, and peri-procedural imaging support have further expanded the scope of IR and reinforced its integration into multidisciplinary and longitudinal patient management [3,4]. This evolution has generated organizational requirements extending beyond procedural expertise, including appropriate referral pathways, multidisciplinary coordination, staffing, infrastructure, patient safety, and quality monitoring within increasingly complex healthcare systems [5].

The organizational dimension is particularly relevant when emergency and elective IR activities coexist within the same hospital network. Contemporary recommendations for the provision of IR services emphasize the importance of appropriate infrastructure, trained personnel, clinical integration, and service organization [6–8], while oncology-oriented IR requires additional coordination with Medical Oncology, Hematology, Nuclear Medicine, Surgery, Gastroenterology, Urology, Anesthesiology, and other peri-procedural services [9,10]. Accreditation and quality-assurance initiatives in interventional oncology further emphasize structured governance, traceability, patient pathways, and systematic quality management [11,12]. Accordingly, activation of an angiographic suite should be regarded not solely as technological acquisition, but as a healthcare service-design intervention in which infrastructure, professional responsibilities, workflow, safety processes, and monitoring systems must be developed coherently.

Despite this growing body of procedural, professional, and quality guidance, an important organizational gap remains. The existing IR literature extensively addresses clinical practice, service provision, procedural standards, accreditation, multidisciplinary care, and quality assurance, whereas comparatively less attention has been devoted to transparent pre-implementation frameworks describing how institution-specific organizational evidence can be translated into an integrated service architecture before a new angiographic service becomes operational. This gap is particularly relevant in multi-hospital systems in which emergency and time-dependent IR pathways must coexist with protected elective oncology-oriented activity. In these settings, the challenge is not simply to identify which procedures should be performed, but to determine how network allocation, infrastructure, governance, professional roles, patient pathways, safety requirements, and prospective performance monitoring should be configured as interdependent components of the same organizational model.

To strengthen the conceptual basis of such service design, the present study was informed by Donabedian's Structure–Process–Outcome model. Within this perspective, organizational structure includes network configuration, infrastructure, technology, staffing, and governance; process includes referral, patient allocation, multidisciplinary coordination, peri-procedural workflow, safety practices, documentation, and communication; and outcome encompasses the indicators through which service performance can subsequently be evaluated. Because the present study was conducted before prospective evaluation of the new service, outcomes were defined as future monitoring domains rather than

observed endpoints. This conceptual framework was complemented by internationally recognized normative standards addressing quality management, healthcare-specific process quality, risk management, occupational safety, medical-device-related quality processes, and organizational governance. The combination of a healthcare quality framework with normative standards was intended to link conceptual service organization with operational requirements rather than to imply formal certification of the proposed service. Accordingly, the theoretical relevance of the study lies not in proposing or testing a new organizational theory, but in translating an established healthcare-quality model into a traceable pre-implementation architecture for a context-specific, network-based IR service.

Against this background, the present study aimed to develop a pre-implementation, document-based organizational framework for the planned activation of an oncology-oriented angiographic suite at the P.O. of Barletta within the ASL BT dual-hospital network. Specifically, the study sought to make explicit the analytical pathway linking institutional requirements to proposed network allocation, structural and professional requirements, procedural scope, multidisciplinary governance, standardized patient pathways, safety architecture, and prospective quality-monitoring indicators. The study was designed to formalize the organizational architecture preceding implementation and was not intended to evaluate clinical effectiveness, service performance, or post-implementation outcomes.

2. Materials and Methods

2.1. Study Design

This study was designed as a context-specific, pre-implementation, document-based organizational framework development study. Its purpose was to formalize a network-based service model for the planned activation of an oncology-oriented angiographic suite within a dual-hospital healthcare system.

The unit of analysis was the organizational model and its supporting institutional documentation. Patients, individual procedures, and clinical outcomes were not units of analysis. The study therefore focused on service design before implementation rather than on the evaluation of clinical or organizational outcomes after activation.

The proposed framework was grounded in institutional planning, document-based contextual assessment, multidisciplinary process mapping, and workflow standardization. At the time of the study, it had not undergone prospective implementation evaluation, external validation, formal expert-consensus validation, or comparative assessment against an alternative organizational model.

The primary objective was to develop a structured organizational framework for allocating elective oncology-oriented angiographic activity within the Azienda Sanitaria Locale Barletta–Andria–Trani (ASL BT) network while preserving emergency and time-dependent interventional activity at the existing referral site. Angiographic-suite activation was therefore approached as a healthcare service-design intervention rather than as a purely infrastructural or technological event.

The analytical process addressed four objectives:

1. To define the network-level rationale for differentiating emergency and elective IR activity;
2. To identify the structural, technological, and professional requirements of the Barletta angiographic suite;
3. To define standardized pre-, intra-, and post-procedural pathways;
4. To establish a prospective set of quality and safety indicators for future implementation monitoring and audit.

This approach is consistent with the recognition of IR as a clinically integrated specialty whose effectiveness depends not only on procedural expertise, but also on service

design, multidisciplinary coordination, patient pathways, safety processes, and governance architecture [13,14].

2.2. Conceptual Framework

The development and organization of the proposed framework were informed by Donabedian's Structure–Process–Outcome model [15], which conceptualizes healthcare quality through the relationship between the structural attributes of a healthcare setting, the processes through which care is organized and delivered, and the outcomes subsequently observed. The model was used as an organizing conceptual framework rather than as a theory subjected to confirmatory testing.

Within the present study, the Structure domain encompassed the configuration of the hospital network, the allocation of angiographic infrastructure, technological resources, staffing requirements, professional competencies, multidisciplinary interfaces, and governance responsibilities. The Process domain encompassed referral and patient allocation, assessment of procedural appropriateness, multidisciplinary coordination, pre-procedural preparation, intra-procedural workflow, radiation protection and safety procedures, post-procedural monitoring, documentation, communication, and follow-up planning. The Outcome domain was represented by the predefined quality, safety, accessibility, and organizational indicators proposed for prospective assessment after service activation.

Because the present study was conducted at the pre-implementation framework-development stage and did not analyze post-implementation clinical or operational data, the Outcome domain should not be interpreted as an observed study endpoint. Rather, it defines the measurement architecture through which the assumptions and intended organizational effects of the framework may subsequently be evaluated. The Structure–Process–Outcome model therefore provided the conceptual linkage between organizational resources, operational processes, and future evaluation, while the normative standards described below were used to define complementary quality, safety, risk-management, and governance requirements. The use of the Structure–Process–Outcome model in this study was translational rather than confirmatory. The study did not test, validate, refute, or modify the model. Instead, it operationalized the three domains prospectively by linking predefined structural and process components to an outcome measurement architecture intended for future post-implementation evaluation.

2.3. Normative Framework

The conceptual organization of the service model was complemented by internationally recognized normative frameworks addressing quality management, healthcare-specific process quality, risk management, occupational safety, medical-device-related quality processes, and organizational governance. The standards were selected according to their relevance to distinct components of the proposed angiographic service rather than as a generic collection of accreditation requirements.

ISO 9001:2015 [16] was selected to support a process-based approach to quality management, documented responsibilities, internal audit, corrective action, and continuous improvement. EN 15224:2016 [17] was included because it applies quality-management principles specifically to healthcare organizations and therefore provides a healthcare-oriented reference for patient pathways, clinical processes, and quality governance. ISO 31000:2018 [18] was used as a reference for systematic identification, assessment, treatment, and monitoring of organizational risk, whereas ISO 45001:2018 [19] provided the relevant framework for occupational health and safety, including staff protection within a radiation-intensive procedural environment. ISO 13485:2016 [20] was considered relevant to controlled documentation, process traceability, and quality-management principles related to the use and lifecycle

oversight of medical devices and associated technologies. Finally, ISO 37000:2021 [21] was used to inform organizational governance, accountability, stakeholder responsibilities, oversight, and decision-making.

These standards were operationalized across the proposed workflow, safety, quality, and governance domains, as summarized in Table 1. Their inclusion indicates alignment of the framework with relevant normative principles; it does not represent or imply formal ISO certification, accreditation, or conformity assessment of the angiographic service (Table 1).

Table 1. Alignment of the proposed organizational framework with internationally recognized ISO standards.

Organizational Domain	ISO/EN Standard	Key Principles	Application Within Proposed Framework
Workflow	EN 15224:2016; ISO 13485:2016 [17,20]	Traceability, documentation, controlled processes	Three-phase standardized pathway
Safety	ISO 31000:2018; ISO 45001:2018 [18,19]	Occupational safety, risk assessment	Radiation protection, checklist, emergency preparedness
Quality	ISO 9001:2015 [16]; EN 15224:2016 [17]	Process management, PDCA, audit	KPI monitoring and periodic audit
Governance	ISO 37000:2021 [21]	Accountability, stakeholder oversight	Network-based governance

2.4. Literature Contextualization and Gap Identification

A structured contextual literature review was conducted to define the organizational knowledge gap and to position the proposed framework in relation to existing approaches to Interventional Radiology (IR) service delivery, multidisciplinary care, quality assurance, accreditation, and service implementation.

The literature search was performed in PubMed/MEDLINE and Scopus. Searches combined terms related to the clinical discipline and organizational setting, including “interventional radiology”, “service organization”, “service provision”, “angiographic suite”, “workflow”, “clinical governance”, “quality assurance”, “accreditation”, “interventional oncology”, “hospital network”, and “service implementation”. Boolean combinations of these terms were adapted to the syntax of each database. Reference lists of relevant articles were additionally reviewed, and professional or institutional guidance from major IR and interventional-oncology organizations was considered when directly relevant to service organization, quality assurance, or accreditation.

The contextual review focused on the peer-reviewed literature and professional guidance addressing IR service organization, multidisciplinary clinical integration, angiographic-suite design, workflow, clinical governance, quality assurance, accreditation, interventional oncology, and hospital-network organization. The purpose was to identify the organizational domains already addressed in the literature and to clarify the comparatively under-reported challenge of integrating network allocation, multidisciplinary governance, standardized workflow, safety architecture, and predefined performance monitoring into a single pre-implementation service model.

This literature component was contextual rather than systematic or evidentiary. It was not designed as a systematic review, meta-analysis, or quantitative evidence synthesis, and no formal risk-of-bias assessment or pooled analysis was performed. Nevertheless, the use of predefined databases, search concepts, and supplementary reference checking was intended to make the literature-contextualization stage transparent and reproducible. The review supported identification of the research gap, selection of the organizational domains, and interpretation of the proposed framework rather than assessment of comparative

effectiveness or generation of pooled evidence. The final literature search was performed on 2 September 2026.

2.5. Setting and Organizational Context

The study was conducted within ASL BT, a public healthcare network in Southern Italy, including two first-level emergency hospitals, the Presidio Ospedaliero (P.O.) of Andria and the P.O. of Barletta. Although both institutions operate within the same territorial network, they are characterized by different clinical missions and organizational vocations. According to the institutional planning framework underlying the present project, the P.O. of Andria functions as the main site for emergency and urgent cardio-cerebrovascular and neuro-interventional pathways, supported by time-dependent acute care services. By contrast, the P.O. of Barletta hosts a strong oncology-oriented and multidisciplinary platform, including Medical Oncology, Hematology, Nuclear Medicine, and Radiation Oncology, and serves as a referral center for onco-hematologic care within the local health system.

This organizational asymmetry provided the institutional rationale for differentiating angiographic activity according to clinical mission, pathway urgency, and multidisciplinary requirements. Within this context, acquisition and installation of the new angiographic system at the P.O. of Barletta were framed as components of a broader service-reorganization initiative rather than as an isolated technological expansion.

The proposed suite was intended to support planned elective IR procedures, particularly those integrated with oncologic and other multidisciplinary pathways. At the organizational-design level, allocation of these procedures to Barletta was also intended to preserve the emergency and time-dependent role of the Andria site. Whether this configuration ultimately modifies workload distribution, accessibility, or operational performance requires prospective evaluation after implementation. This network-based approach is consistent with contemporary IR service-planning principles, in which hospital mission, procedural complexity, patient-pathway requirements, and available organizational capacity are considered when allocating activity [4,5,13,14].

2.6. Institutional Documentary Corpus and Data Sources

The analytical corpus consisted of three interrelated institutional documentary components produced within ASL BT in connection with the planned activation of the angiographic suite at the P.O. of Barletta: (1) the institutional deliberative/transmission act No. 613 dated 9 April 2026, concerning formal adoption of the organizational pathway; (2) the complete Organizational Model for the Activation of the Angiographic Suite at the P.O. of Barletta, attached to the institutional act; and (3) the associated administrative and planning documentation describing the ASL BT network configuration, the respective organizational missions of the Andria and Barletta hospitals, angiographic technology allocation, multidisciplinary integration, and governance requirements underlying activation of the new service.

The documents were included because they directly addressed the organizational rationale, governance, procedural scope, professional responsibilities, technological requirements, workflow, safety, or monitoring architecture of the planned Barletta angiographic service. Documents unrelated to the organization or activation of the angiographic suite and documents containing only patient-specific clinical information were outside the analytical scope.

The documentary material was treated as the primary source for identifying the institutional rationale for differentiating emergency and elective IR pathways, the oncology-oriented mission of the Barletta service, the planned procedural portfolio, professional

and multidisciplinary interfaces, pre-, intra-, and post-procedural requirements, and the intended safety and quality-monitoring architecture.

No patient-level clinical registry, retrospective or prospective procedural database, epidemiological demand dataset, or post-implementation outcomes dataset was included. Accordingly, the unit of analysis was the organizational model and its supporting institutional documentation rather than individual patients, procedures, or clinical outcomes.

2.7. Documentary Analysis and Framework Derivation

The institutional material was examined using a structured qualitative document-analysis approach [22]. The analytical procedure was designed to preserve traceability between information explicitly contained in the source documents and the organizational components subsequently developed for the proposed framework.

The analysis comprised five sequential stages.

First, document familiarization was performed. The complete documentary corpus was reviewed to identify explicit statements concerning network configuration, hospital mission, procedural allocation, infrastructure, professional responsibilities, multidisciplinary interfaces, workflow, patient safety, radiation protection, quality assurance, and audit.

Second, relevant information was extracted and categorized. Statements were grouped into predefined organizational domains corresponding to the principal service-design areas identified in the institutional model.

Third, document-derived organizational requirements were identified. At this stage, the analysis remained limited to information supported directly by the institutional documents.

Fourth, the document-derived requirements were translated into proposed framework components. These components included network-allocation rules, structural and professional requirements, procedural pathways, safety controls, governance responsibilities, and prospective monitoring indicators.

Fifth, the proposed framework components were conceptually and normatively mapped. They were classified according to the Structure–Process–Outcome model and, where applicable, aligned with the standards described in Section 2.3.

M.M. and L.F.C. performed the primary documentary analysis and organized the extracted material. G.G. reviewed the methodological interpretation and internal coherence of the framework. The complete framework and manuscript were subsequently reviewed by the multidisciplinary author group. This process was intended to verify internal consistency and correspondence with the documentary sources; it did not constitute independent external validation.

The professional roles incorporated into the organizational framework—including Interventional Radiology, Diagnostic Radiology, Oncology, Hematology, Nuclear Medicine, Gastroenterology, Surgery, Urology, Anesthesiology, Clinical Engineering, Medical Physics, Radiation Protection, Risk Management, and Medical Direction—were identified from the institutional documents. Their inclusion should therefore be interpreted as a document-derived representation of the professional interfaces required by the proposed organizational model. No separate stakeholder interviews, focus groups, Delphi procedure, or formal co-design process was conducted.

Table 2 makes the analytical transition explicit by linking each principal document-derived finding to the corresponding organizational requirement and proposed framework response.

Table 2. Traceability from institutional findings to proposed organizational framework components.

Document-Derived Finding	Identified Organizational Requirement	Proposed Framework Response	Structure–Process–Outcome Domain	Status
Andria is designated within the network for emergency and time-dependent cardio-cerebrovascular and neuro-interventional pathways.	Preserve emergency angiographic capacity and avoid organizational competition with scheduled elective activity.	Maintain emergency/ time-dependent IR pathways at Andria and allocate eligible planned elective activity to Barletta.	Structure/Process	Pre-implementation organizational allocation
Barletta concentrates oncology-oriented and multidisciplinary services, including Medical Oncology, Hematology, Nuclear Medicine, and Radiation Oncology.	Integrate elective IR activity with existing cancer-related multidisciplinary pathways.	Develop an oncology-oriented elective angiographic service at Barletta linked to the local multidisciplinary platform.	Structure/Process	Pre-implementation service design
Institutional planning identifies a defined portfolio of elective image-guided and angiographic procedures.	Establish boundaries for local procedural activity and avoid indiscriminate duplication of the Andria service.	Define a planned core procedural portfolio and distinguish it from conditional future extensions.	Structure/Process	Planned portfolio
Source documents identify multiple clinical, technical, and governance actors involved in service activation.	Define professional responsibilities and multidisciplinary interfaces.	Formalize roles for IR, referring specialties, Anesthesiology, Medical Physics, Clinical Engineering, Radiation Protection, Risk Management, and Medical Direction.	Structure/Process	Document-derived governance architecture
Institutional documentation requires organized peri-procedural management rather than procedure-only activity.	Provide a traceable patient pathway from referral through recovery and follow-up planning.	Standardize referral, assessment, preparation, intra-procedural management, recovery, reporting, and handover into pre-, intra-, and post-procedural phases.	Process	Proposed standardized pathway
Safety, radiation protection, infection prevention, equipment oversight, and emergency preparedness are identified as core requirements.	Integrate safety controls into service design before activation.	Incorporate checklist-based verification, radiation monitoring, infection-control requirements, equipment quality assurance, and contingency procedures.	Structure/Process	Pre-implementation safety architecture
Institutional planning includes future monitoring and audit requirements.	Establish an evaluation architecture before service activation.	Define prospective KPIs addressing workflow, access, technical performance, safety, radiation exposure, transfers, and continuity of care.	Outcome	Proposed; not yet empirically evaluated

2.8. Framework Development and Organizational Domains

Following document extraction and interpretation, the framework-development phase translated the identified organizational requirements into an operational service architecture. Four sequential design steps were used.

Step 1: Network-level allocation. Document-derived information concerning the distinct missions of the Andria and Barletta hospitals was translated into a proposed dual-pathway configuration. Under this configuration, emergency and time-dependent IR activity remained allocated to Andria, whereas eligible planned elective oncology-oriented activity was assigned to Barletta.

Step 2: Procedural scope and pathway boundaries. Procedures explicitly identified within the institutional planning framework were organized into a core planned procedural portfolio. Emergency or time-dependent interventions, procedures outside the defined portfolio, and cases exceeding locally available resources were excluded from the Barletta pathway. Potential future or conditional extensions were identified separately.

Step 3: Professional competencies and multidisciplinary interfaces. Professional roles and multidisciplinary relationships described in the source documents were mapped to the proposed functions required for referral, patient assessment, procedural delivery, peri-procedural support, technological oversight, radiation protection, risk management, and audit.

Step 4: Workflow, safety, and prospective monitoring. Document-derived requirements were translated into proposed pre-, intra-, and post-procedural processes, safety and traceability controls, and a prospective quality-monitoring architecture.

The resulting model was organized into six operational domains:

1. Governance and Network Allocation;
2. Structural and Technological Requirements;
3. Professional Competencies and Multidisciplinary Interfaces;
4. Procedural Scope and Patient Pathways;
5. Safety, Radiation Protection, and Infection Control; and
6. Quality Indicators and Audit.

These domains provided the organizational structure used to present the proposed framework and interpret its components (Table 2).

2.9. Workflow Standardization and Organizational Allocation Criteria

The standardized pathway was organized around both site-allocation criteria and the subsequent pre-, intra-, and post-procedural workflow. The allocation criteria were intended to define the organizational boundary between the elective Barletta pathway and the emergency or higher-complexity pathway maintained within the wider ASL BT network.

Cases were considered organizationally appropriate for the Barletta elective pathway when all of the following conditions were met: the procedure was elective; it fell within the defined local procedural portfolio; the required personnel and technological resources were available; the necessary peri-procedural and anesthesiology support could be provided; and no emergency or time-dependent management was required.

Cases were allocated or redirected to Andria or another appropriate referral hub when the procedure was emergency or time-dependent, fell outside the defined local portfolio, required unavailable specialist support, involved anticipated complexity exceeding local capabilities, or was associated with unexpected clinical instability.

These criteria represent organizational pathway-allocation principles rather than validated clinical eligibility criteria. Procedure-specific indication, contraindication, and technical feasibility remain subject to clinical assessment by the responsible interventional radiologist and relevant multidisciplinary team.

For patients allocated to Barletta, the pathway was structured into three sequential phases: pre-procedural, intra-procedural, and post-procedural. The complete allocation and workflow architecture is summarized in Table 3.

Table 3. Organizational allocation criteria and proposed standardized patient pathway for elective angiographic procedures at the P.O. of Barletta.

Pathway Component	Criteria/Main Activities	Key Professionals Involved	Core Organizational/ Safety Check
A. ORGANIZATIONAL ALLOCATION CRITERIA			
Allocation to Barletta	Elective procedure; procedure included within the approved/core local portfolio; adequate local personnel and technological resources; required peri-procedural support available; no time-dependent emergency requirement.	Interventional Radiologist; referring specialist; multidisciplinary team when indicated	Confirm compatibility with elective pathway, local procedural scope, required support resources, and anticipated risk/complexity.
Allocation/referral to Andria or another appropriate hub	Emergency or time-dependent procedure; required specialist or anesthesiology support unavailable locally; anticipated complexity exceeding Barletta capabilities; procedure outside the defined local portfolio; unexpected clinical instability.	Interventional Radiologist; referring specialist; emergency/receiving team; Medical Direction when required	Ensure timely escalation or transfer and avoid inappropriate management of cases exceeding the organizational capabilities of the elective site.
B. PRE-PROCEDURAL PATHWAY			
Referral and indication	Referral from requesting specialty; transmission of relevant clinical and imaging documentation; preliminary identification of procedural need.	Referring specialist; IR team	Confirmation that the request falls within the Barletta elective pathway and procedural portfolio.
Clinical and imaging review	Review of prior imaging, indication, expected technical feasibility, procedural complexity, and need for multidisciplinary discussion.	Interventional Radiologist; referring specialist; multidisciplinary team when indicated	Confirmation of appropriateness and compatibility with local capabilities.
Pre-procedural assessment	Review of laboratory tests, coagulation profile, renal function, allergies, medications, vascular-access considerations, and peri-procedural risk.	Interventional Radiologist; referring/ward physician; nursing staff; Anesthesiologist when required	Completion of required clinical and laboratory prerequisites and escalation if risk/support requirements exceed local capabilities.
Consent and scheduling	Patient information, informed consent, scheduling, and resource allocation.	Interventional Radiologist; nursing staff; booking/administrative support	Confirmation of consent, priority, room availability, staff, equipment, and recovery resources.
Room preparation	Preparation of angiographic suite, devices, materials, sterile field, medications, monitoring, and imaging equipment.	Nurses; radiographers; Interventional Radiologist; technical staff	Equipment functionality, material availability, radiation-protection setup, and room-readiness verification.
C. INTRA-PROCEDURAL PATHWAY			
Patient admission and verification	Patient identification, documentation review, positioning, vascular/venous access as required, monitoring setup.	Nurses; radiographers; Interventional Radiologist; Anesthesiologist when required	Identity, planned procedure, site/procedure match, checklist completion, and monitoring activation.
Procedure performance	Planned angiographic or image-guided intervention with real-time technical and clinical monitoring.	Interventional Radiologist; radiographers; nurses; Anesthesiologist when required	Radiation-dose management, sterile technique, device/material traceability, physiological monitoring, and management of immediate complications.

Table 3. *Cont.*

Pathway Component	Criteria/Main Activities	Key Professionals Involved	Core Organizational/ Safety Check
D. POST-PROCEDURAL PATHWAY			
Immediate monitoring	Recovery/monitored observation, hemodynamic surveillance, access-site or device management, pain control, early-complication detection.	Nursing staff; Interventional Radiologist; Anesthesiology when required	Confirmation of clinical stability and documentation of immediate recovery.
Reporting and communication	Procedural report, documentation of devices/materials and complications, communication with referring team.	Interventional Radiologist; nursing staff; referring specialty	Complete procedural traceability, handover, recommendations, and follow-up instructions.
Discharge/ward return/follow-up	Discharge or return to ward when appropriate; arrangement of clinical/imaging follow-up; coordination with oncology or other services.	Interventional Radiologist; ward team; referring specialist	Confirmation of stability, continuity of care, follow-up plan, and criteria for re-evaluation.

2.10. Quality, Safety, and Prospective Monitoring Framework

Safety and quality requirements identified in the institutional documents were incorporated as predefined components of the framework. The safety architecture included patient and staff radiation protection, procedural dose monitoring, personal protective equipment, infection prevention, environmental and sterilization procedures, equipment quality assurance, checklist-based verification, and escalation procedures for unexpected clinical or procedural events.

The quality-monitoring architecture was designed prospectively. Indicators were selected to cover complementary aspects of workflow, accessibility, process adherence, procedural performance, patient and occupational safety, continuity of care, and network appropriateness. Consistent with the Structure–Process–Outcome framework, these indicators represent the planned measurement component through which the organizational assumptions of the model can be assessed after implementation. No indicator was quantitatively evaluated in the present study. Data sources and monitoring frequencies were therefore defined prospectively as components of the future evaluation architecture.

Numerical performance targets were not imposed when no local baseline or directly applicable validated threshold was available. Where statutory, regulatory, or institutional requirements already apply—for example, to occupational radiation surveillance—monitoring should follow the relevant requirement. For all other indicators, local benchmarks should be established after an initial period of prospective baseline data collection and subsequently refined through periodic audit (Table 4).

Table 4. Proposed indicators for prospective post-implementation monitoring of the angiographic suite.

Indicator	Evaluation Domain	Operational Definition	Proposed Data Source	Proposed Monitoring Frequency	Benchmark/Target Status
Turnover time between procedures	Workflow efficiency/ Process	Time from completion of one procedure to start of the next scheduled procedure.	Angiographic scheduling and procedure logs	Monthly	Baseline-derived; target to be defined prospectively

Table 4. *Cont.*

Indicator	Evaluation Domain	Operational Definition	Proposed Data Source	Proposed Monitoring Frequency	Benchmark/Target Status
Same-day cancellation rate	Access/Process	Proportion of scheduled procedures cancelled on the day of intervention.	Booking system/cancellation log	Monthly	Baseline-derived; reasons for cancellation to be audited
Checklist adherence rate	Safety/Process	Proportion of eligible procedures with complete documented procedural safety checklist.	Procedural checklist/electronic or paper record	Monthly	Institutional compliance target to be defined; completeness expected for eligible procedures
Technical success rate	Procedural performance/Outcome	Proportion of procedures completed according to the predefined technical objective.	Procedural reports	Quarterly	Procedure-specific baseline/benchmark where available
Major complication rate	Clinical safety/Outcome	Proportion of procedures associated with major adverse events requiring escalation of care, unplanned intervention, prolonged hospitalization, or clinically significant harm.	Clinical record/adverse-event reporting system	Quarterly	Procedure-specific benchmark where available; otherwise, baseline-derived
Procedure-related infection rate	Infection control/Outcome	Proportion of procedures followed by documented procedure-related infectious complications within the predefined surveillance interval.	Clinical record/infection-control surveillance	Quarterly	Baseline-derived and compared with applicable institutional standards
Patient radiation exposure	Radiation safety/Process–Outcome	Procedure-related exposure metrics, including dose-area product, fluoroscopy time, and cumulative dose where available.	Angiographic dose report/dose-management system	Continuous capture; periodic quarterly audit	Compared with applicable local/national diagnostic or procedural reference practices where available
Worker radiation exposure	Occupational safety/Outcome	Occupational exposure recorded through institutional dosimetry.	Occupational dosimetry system	According to statutory/institutional surveillance schedule	Applicable regulatory/institutional limits
Post-procedural observation adherence	Continuity/Process	Proportion of patients receiving documented observation appropriate to the predefined procedural pathway and risk profile.	Recovery/clinical documentation	Monthly or quarterly	Baseline-derived; pathway compliance to be prospectively assessed
30-day procedure-related readmission	Continuity/Outcome	Proportion of patients readmitted within 30 days for events reasonably related to the procedure.	Hospital information system/clinical record	Quarterly	Baseline-derived; no a priori local threshold

Table 4. *Cont.*

Indicator	Evaluation Domain	Operational Definition	Proposed Data Source	Proposed Monitoring Frequency	Benchmark/Target Status
Procedure-related transfer rate	Network appropriateness/ Outcome	Proportion of patients allocated to Barletta requiring transfer because the planned procedure cannot be initiated or completed locally or because escalation is required.	Transfer log/ clinical record	Quarterly	Baseline-derived; reasons for transfer to undergo structured audit
Elective waiting time	Accessibility/ Outcome	Time from validated procedural indication to procedure performance for elective oncology-oriented interventions.	Booking/scheduling system	Monthly	Baseline-derived; target to be established after initial service evaluation

2.11. Methodological Boundaries and Validation Status

Several methodological boundaries were predefined to ensure appropriate interpretation of the study.

First, this was a pre-implementation organizational framework development study. It did not quantitatively evaluate procedural volume, waiting times, service utilization, technical success, complications, radiation exposure, patient-reported outcomes, costs, or other post-implementation measures.

Second, the framework was derived primarily from institutional planning, administrative, governance, and organizational documents and from a document-based contextual assessment of the ASL BT hospital network. It was not developed through direct ethnographic observation, time-motion analysis, prospective implementation research, stakeholder interviews, focus groups, Delphi consensus, or formal co-design procedures.

Third, the proposed quality and performance indicators were defined as prospective monitoring measures. They were not empirically tested and should not be interpreted as validated outcomes or demonstrated measures of service performance.

Fourth, the framework had not undergone prospective implementation evaluation, external validation, formal expert-consensus validation, comparative assessment against another organizational model, or evaluation in another healthcare setting.

These boundaries reflect the purpose of the study, which was to formalize the organizational architecture preceding service implementation and make its assumptions, governance components, workflow logic, safety requirements, and future measurement structure explicit and traceable. Prospective implementation and evaluation will be required to assess feasibility, organizational performance, clinical implications, and external applicability.

2.12. Ethical and Reporting Considerations

This study reports the development of a pre-implementation organizational framework for the planned activation of an angiographic suite and was based on institutional planning, administrative, governance, and organizational documents. No human participants were enrolled, and no identifiable patient-level data, biological samples, prospective clinical interventions, or individual clinical outcomes were analyzed.

Accordingly, the study did not constitute human-subject clinical research and did not require informed consent. No formal ethics-committee exemption was used as the methodological basis of the study; therefore, the manuscript does not describe ethical approval as having been formally “waived” by an ethics committee.

The manuscript was prepared to distinguish clearly between information derived from institutional documentation, organizational components formalized within the proposed framework, and outcomes reserved for future prospective evaluation. No post-implementation clinical or organizational effectiveness claims are made on the basis of the present analysis.

3. Results

3.1. Document-Derived Organizational Requirements

The documentary analysis identified a set of interrelated organizational requirements underlying the planned activation of the Barletta angiographic suite. The first concerns network role differentiation. Institutional documentation characterized Andria as the principal site for emergency and time-dependent cardio-cerebrovascular and neuro-interventional activity, whereas Barletta was characterized by a stronger oncology-oriented and multidisciplinary service configuration. This represented the institutional basis for differentiating emergency and time-dependent angiographic activity from planned elective angiographic activity across the two sites. A second requirement concerned integration with existing specialist pathways. The concentration at Barletta of Medical Oncology, Hematology, Nuclear Medicine, Radiation Oncology, and other multidisciplinary services supported the organizational rationale for locating selected elective oncology-oriented procedures within that hospital rather than reproducing an undifferentiated angiographic service at both sites.

Additional requirements concerned definition of procedural boundaries, availability of appropriately trained professionals, integration of anesthesiology and peri-procedural support where necessary, technological and environmental requirements, radiation protection, infection prevention, documentation and traceability, and establishment of prospective audit architecture. These findings represented document-derived organizational requirements and were subsequently translated into framework components as shown in Table 2. The elements reported in this subsection represent findings derived directly from the institutional documentary corpus. By contrast, the organizational configurations presented in Sections 3.2–3.7 represent proposed framework components developed by translating those findings into a structured service architecture.

3.2. Proposed Governance, Network Allocation, and Procedural Scope

On the basis of the document-derived organizational requirements, the authors developed a proposed dual-site configuration. Under this configuration, emergency and time-dependent IR activity would remain allocated to Andria, whereas Barletta would host planned elective angiographic activity compatible with its oncology-oriented and multidisciplinary mission.

This configuration represents a proposed framework response rather than a document-derived outcome. The present study does not provide post-implementation evidence that the proposed allocation improves efficiency, accessibility, safety, or clinical outcomes.

The Barletta procedural portfolio was stratified into a core planned portfolio and potential future or conditional extensions. The core portfolio comprised TACE, TARE, thermoablative procedures, image-guided biopsies, and selected biliary or abdominal drainage procedures. Selected urologic interventions and broader integrated gastroenterological or other multidisciplinary procedures were considered potential extensions, conditional on institutional approval, available expertise, technological resources, anesthesiology or other specialist support where required, and prospective assessment of service capacity.

The procedural scope was therefore defined by organizational capability rather than by the theoretical technical possibilities of an angiographic suite. Emergency/time-dependent procedures, interventions outside the approved portfolio, or cases requiring resources

beyond those available at Barletta remained within the Andria pathway or another appropriate referral pathway.

3.3. Proposed Professional Competencies and Multidisciplinary Interfaces

The source documents identified a multidisciplinary governance structure involving Interventional Radiology, Diagnostic Radiology, Medical Oncology, Hematology, Nuclear Medicine, Gastroenterology, Surgery, Urology, Anesthesiology, Clinical Engineering, Medical Physics, Radiation Protection, Risk Management, and Medical Direction.

Within the resulting framework, the Interventional Radiologist was assigned responsibility for procedural assessment, technical feasibility, execution, and peri-procedural decision-making. Referring specialists were integrated into indication, multidisciplinary discussion where appropriate, and continuity of care. Nursing and radiographic personnel were incorporated into procedural preparation, monitoring, radiation-safety practice, and post-procedural care. Clinical Engineering and Medical Physics were linked to technological oversight and quality assurance, Radiation Protection to institutional dose governance, and Risk Management and Medical Direction to organizational oversight and audit.

The need for these professional interfaces was identified from the institutional documents. Their specific organization within the service architecture represents a proposed framework component and should not be interpreted as the result of a separate stakeholder-consensus or co-design process.

3.4. Proposed Procedural Scope and Patient Pathways

The framework defined explicit organizational criteria for allocation to the Barletta elective pathway. Eligible cases were planned elective interventions within the local procedural portfolio for which required personnel, technology, peri-procedural resources, and specialist support were available. Emergency or time-dependent cases, interventions outside the defined portfolio, cases requiring unavailable specialist support, procedures with anticipated complexity beyond local capabilities, or patients developing unexpected clinical instability were allocated or escalated to Andria or another appropriate referral hub.

Following allocation, the Barletta patient pathway was organized into three sequential phases: pre-procedural, intra-procedural, and post-procedural. The pre-procedural phase included referral, clinical and imaging review, confirmation of indication and technical feasibility, laboratory and risk assessment, anesthesiology evaluation when required, informed consent, scheduling, and resource verification. The intra-procedural phase incorporated patient and procedure verification, room and equipment preparation, procedural execution, physiological monitoring, radiation protection, sterility, and immediate complication management. The post-procedural phase included observation, access-site or device management, detection of early complications, procedural reporting, communication and handover, discharge or ward return, and follow-up planning.

The resulting pathway represents a proposed framework component developed from the document-derived organizational requirements. It has not yet been prospectively evaluated for feasibility, adherence, efficiency, safety, or outcome impact. The complete allocation and workflow architecture is summarized in Table 3.

3.5. Proposed Safety, Radiation Protection, and Infection-Control Architecture

Safety requirements were integrated into the framework as pre-implementation organizational components rather than post hoc measures. The resulting architecture incorporated systematic patient and staff radiation protection, procedural dose documentation, personal protective equipment, environmental and infection-control requirements, sterilization processes, equipment quality assurance, checklist-based verification, and predefined pathways for recognition and escalation of unexpected complications. The governance component

was aligned with the principles of ISO 37000:2021 [21], while occupational safety and systematic risk-management requirements were mapped respectively to ISO 45001:2018 [19] and ISO 31000:2018 [18]. These normative relationships were used to structure accountability, risk identification, oversight, and safety processes. They do not constitute evidence of formal conformity or certification.

3.6. Proposed Quality Indicators and Audit Architecture

The framework generated a predefined prospective monitoring architecture covering workflow, accessibility, procedural performance, clinical and occupational safety, radiation exposure, continuity of care, and network appropriateness. The quality-management component was aligned with ISO 9001:2015 [16] and EN 15224:2016 [17], with emphasis on process documentation, measurement, audit, and continuous improvement.

The proposed indicators included turnover time between procedures, same-day cancellation rate, checklist adherence rate, technical success rate, major complication rate, procedure-related infection rate, patient radiation exposure, worker radiation exposure, post-procedural observation adherence, 30-day procedure-related readmission, procedure-related transfer rate, and elective waiting time. Because no post-implementation dataset was analyzed, none of these indicators represent an observed result of the present study. Rather, they define the prospective measurement architecture through which service feasibility and performance can be assessed after activation. Proposed data sources, monitoring frequencies, and benchmark status are summarized in Table 4.

3.7. Proposed Implementation Architecture and Future Evaluation

The final output of the study was a pre-implementation organizational architecture linking institutional requirements to network allocation, procedural scope, professional interfaces, standardized workflow, safety processes, and prospective performance monitoring. The framework therefore specifies what should be established and subsequently measured before conclusions can be drawn regarding the organizational effects of the new service.

Implementation should be followed by prospective assessment of procedural volume, referral patterns, waiting times, cancellation rates, workflow adherence, technical performance, adverse events, radiation exposure, transfers, readmissions, and other predefined indicators. These data will be required to determine whether the assumptions underlying network differentiation and elective pathway allocation are feasible in routine practice.

The framework was developed for the specific configuration of the ASL BT network and has not undergone external validation. Accordingly, applicability to other hospitals should be considered a hypothesis for future evaluation rather than a demonstrated property of the present model. Adaptation to other settings would require assessment of local case mix, hospital mission, staffing, infrastructure, emergency pathways, multidisciplinary resources, and governance capacity.

4. Discussion

4.1. Principal Findings and Organizational Contribution

The present study developed a context-specific, pre-implementation, document-based organizational framework for the planned activation of an oncology-oriented angiographic suite within a dual-hospital network. Its principal contribution is the explicit reconstruction of the pathway connecting institutional planning requirements with a proposed operational service architecture.

Rather than treating angiographic-suite activation as an equipment-driven event, the framework integrates network allocation, procedural scope, structural and technological

requirements, professional interfaces, standardized patient pathways, safety governance, and prospective quality monitoring.

This positioning reflects the broader evolution of IR from a predominantly procedure-oriented activity toward a clinically integrated service requiring patient management, longitudinal coordination, multidisciplinary interaction, and formal organizational structures [23–27]. Existing recommendations already define important requirements for IR service provision, infrastructure, professional competence, and accreditation [4,5], while interventional-oncology initiatives emphasize quality assurance and structured service standards [11,12].

The present study does not seek to replace these existing models. Its contribution lies in addressing an earlier stage of service development: the transparent translation of institution-specific organizational evidence into a pre-implementation architecture before clinical or operational performance can be measured.

4.2. Conceptual Integration of Structure, Process, and Future Outcomes

Use of the Structure–Process–Outcome model provides a conceptual basis for distinguishing elements that might otherwise appear as an undifferentiated list of organizational requirements [15]. Network configuration, infrastructure, technology, staffing, and governance constitute structural conditions; referral, patient allocation, multidisciplinary coordination, procedural workflow, safety procedures, communication, and documentation represent processes; and the proposed performance indicators define the future outcome and evaluation domains.

This distinction is particularly important for interpreting the present study because no causal relationship between these domains has yet been tested. The framework does not demonstrate that a specific structural configuration produces better outcomes. Instead, it formulates an explicit and prospectively testable organizational hypothesis: that a defined structure and standardized processes can be implemented and subsequently evaluated through predefined measures. The distinction between the proposed design and the demonstrated effect is essential in avoiding overinterpretation of pre-implementation organizational research.

From a theoretical perspective, the present study does not confirm, refute, modify, or validate the Structure–Process–Outcome model. Its contribution is translational and operational. Specifically, it shows how the three domains can be used prospectively to organize the design of an IR service before implementation, with predefined Structure and Process components linked to a future Outcome measurement architecture. In this sense, the study extends the practical application of Donabedian’s model to a context-specific, network-based, pre-implementation IR setting. The causal relationships among structure, process, and outcomes remain to be assessed empirically after service activation.

The ISO and EN standards provide a complementary normative layer. ISO 9001:2015 [16] and EN 15224:2016 [17] support process-based quality management; ISO 31000:2018 [18] provides a systematic risk-management perspective; ISO 45001:2018 [19] addresses occupational safety; ISO 13485:2016 [20] contributes principles relevant to controlled documentation and medical-device-related quality processes; and ISO 37000:2021 [21] supports governance and accountability. These standards were used to organize relevant domains of the framework and should not be interpreted as evidence of certification or formal conformity assessment.

4.3. Relationship with Existing Interventional Radiology Service Models

The previous IR literature has emphasized clinically integrated practice, adequate infrastructure and staffing, multidisciplinary care, patient management, and quality assur-

ance [3–5,23–27]. CIRSE recommendations for European IR services describe core requirements for service provision, training, professional competence, manpower, and accreditation [4]. Quality-oriented initiatives have also promoted standardized reporting, audit, safety procedures, accreditation, and measurement of practice performance [11,12,28–32]. The present model differs in emphasis rather than in principle. It addresses a specific service-design problem in which two hospitals belonging to the same network have different existing missions: one centered on emergency and time-dependent interventional pathways and the other characterized by a strong oncology-oriented platform. The framework therefore uses network differentiation as an organizational design variable and combines this with explicit patient-allocation boundaries, standardized peri-procedural processes, safety governance, and prospective audit architecture.

Accordingly, the contribution should not be interpreted as proposing a new theory of IR organization or demonstrating superiority over existing models. Rather, it represents a context-specific operationalization of established healthcare-quality, governance, and IR-service principles in a pre-implementation setting where elective and emergency activities must be organizationally differentiated.

4.4. Network-Level Implications of the Proposed Model

The allocation of emergency and time-dependent IR activity to Andria and planned elective oncology-oriented activity to Barletta provides a structured approach to defining complementary rather than duplicate procedural missions. Conceptually, such differentiation may reduce competition between scheduled and emergency use of angiographic capacity and may facilitate integration of elective procedures with oncology-oriented pathways. However, these are intended organizational effects, not outcomes demonstrated by the present study.

The same distinction applies to accessibility and efficiency. Establishing a dedicated elective pathway may create conditions for more predictable scheduling and multidisciplinary coordination, but whether waiting times, cancellations, transfers, resource utilization, or patient access actually improve can only be determined after implementation. The addition of these measures to the prospective KPI framework was therefore intended to convert organizational assumptions into testable post-implementation questions.

4.5. Implementation Barriers and Organizational Risk

Implementation of the proposed framework may encounter barriers that cannot be fully characterized through institutional documents alone.

First, redistribution of procedural activity between hospitals may generate professional or organizational resistance, particularly when established referral pathways or responsibilities must change.

Second, a dual-site model depends on reliable communication and handover processes. Failures in information transfer may compromise continuity of care even when procedural responsibilities are formally defined. These concerns are consistent with evidence emphasizing the importance of teamwork and structured handoffs in radiological care [24,25].

Third, implementation depends on the availability and continuity of specialized personnel. Elective activity at Barletta will require not only interventional radiologists, but also appropriately trained nursing and radiographic staff, anesthesiology support when indicated, recovery capacity, medical physics, clinical engineering, and responsive specialist services. Temporary unavailability of any of these resources may restrict the feasible procedural portfolio.

Fourth, prospective KPI collection introduces an additional organizational burden. Reliable monitoring requires standardized documentation, accessible information systems, clearly assigned data ownership, and sufficient capacity for periodic analysis and audit. Incomplete data or inconsistent documentation across sites may limit interpretation of early performance measures.

Finally, contingency pathways must remain available for unexpected clinical deterioration, procedural complications, or unanticipated complexity exceeding the capabilities of the elective site. Implementation should therefore be considered an iterative process requiring monitoring, feedback, and adjustment rather than a single event completed with room activation.

4.6. Contextual Applicability and Transferability

The organizational domains included in the framework—network allocation, infrastructure, governance, professional interfaces, patient pathways, safety, and prospective monitoring—may also be relevant to other institutions. However, the present study does not demonstrate external transferability.

The framework was derived from a specific configuration in which Barletta and Andria have complementary clinical missions. Andria already serves as the network site for emergency and time-dependent activity, whereas oncology-oriented services are concentrated at Barletta.

Application in another setting would therefore require local adaptation rather than direct reproduction. Relevant contextual variables include existing angiographic capacity, emergency responsibilities, procedural volume, availability of trained interventional radiologists, anesthesiology and recovery resources, maturity of oncology services, information-system capacity, referral patterns, and governance arrangements.

External evaluation should assess both the feasibility of applying the framework and the extent to which its individual components require modification.

4.7. Limitations and Next Steps

Several limitations should be acknowledged.

First, this was a pre-implementation framework-development study. It therefore provides no prospective evidence regarding procedural volume, waiting times, cancellations, technical performance, complications, radiation exposure, transfers, readmissions, patient experience, costs, or other clinical and organizational outcomes. The proposed framework should not be interpreted as evidence of effectiveness.

Second, institutional documents constituted the primary analytical source. Document analysis provides traceability and enables systematic reconstruction of formal organizational requirements [22]. However, formal documents may not capture tacit knowledge, informal workflows, staff concerns, conflicting stakeholder perspectives, evolving service needs, or barriers that emerge only during implementation. No stakeholder interviews, focus groups, Delphi consensus process work, or direct ethnographic observation were conducted.

Third, the framework was developed within a single regional healthcare network. It has not undergone external validation, formal expert-consensus validation, comparative assessment against another organizational model, or prospective feasibility testing. Similarly, the proposed KPIs have not yet been evaluated for completeness, feasibility, reliability, sensitivity to organizational change, or local benchmark performance [30–32].

The next phase should consist of staged implementation followed by prospective evaluation. Initial assessment should examine implementation readiness and adherence to the proposed pathway. Subsequent monitoring should include procedural volume,

referral patterns, waiting times, cancellations, transfers, workflow adherence, technical performance, complications, radiation metrics, and continuity-of-care indicators.

An initial audit cycle should establish local baselines and identify implementation barriers. The framework should then undergo multidisciplinary review and iterative refinement. Subsequent evaluation should examine patient- and service-level outcomes over a predefined follow-up period and, where feasible, assess application in another hospital or healthcare network. Only after these steps will it be possible to determine feasibility, organizational impact, and external applicability.

5. Conclusions

This study developed a theory-informed, context-specific, document-based pre-implementation framework for the planned activation of an oncology-oriented angiographic suite within a dual-hospital network. By integrating institutional requirements with the Structure–Process–Outcome model and relevant international normative standards, the framework defines proposed network allocation, procedural scope, governance responsibilities, structural and professional requirements, standardized patient pathways, safety architecture, and prospective quality-monitoring domains.

The model represents an organizational service-design framework rather than evidence of clinical or organizational effectiveness. Its feasibility, effects on accessibility, workflow performance and safety, and applicability to other healthcare settings remain to be determined through prospective implementation, systematic monitoring of the predefined indicators, iterative audit, external evaluation, and local adaptation.

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Abbreviations

Abbreviation	Full Term
ASL BT	Azienda Sanitaria Locale Barletta–Andria–Trani
IR	Interventional Radiology
P.O.	Presidio Ospedaliero
TACE	Transarterial Chemoembolization
TARE	Transarterial Radioembolization
KPI	Key Performance Indicator
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
PPE	Personal Protective Equipment

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