

**AMERICAN COLLEGE OF RADIOLOGY**  
**Clinical Practice of Interventional Radiology and**  
**Neurointerventional Radiology White Paper**

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**White Paper**  
**Clinical Practice of Interventional Radiology**

**Current Status, Guidelines for Resource Allocation, Future Directions**

Image-guided interventions have become widespread and frequently represent the most important element of care during the course of an individual's illness. While imaging expertise remains the defining skill for the safe, effective performance of these procedures, knowledgeable clinical management of the patient in the pre- and post-procedural period is crucial. Since interventional radiologists are the experts who understand the needs, risks, and implications of the procedures, they have assumed an ever-increasing role in the clinical management of these patients. Interventional radiologists are capable of providing, and in many instances now are expected to provide pre- and post-procedural care in addition to the actual intervention.

Interventional radiology also represents a different kind of radiology practice, one that requires increased time and effort devoted to interacting directly with patients and their families. Establishing a good physician patient relationship is crucial to allow the patients to develop trust in the physician who will be performing an invasive intervention and it allows the physician to more fully understand the needs of the patient, which is a crucial component of clinical judgment. Developing this relationship is also an important element of providing longitudinal care that is often required post-intervention.

## **I. CURRENT STATUS**

### **Why Clinical Practice Is Vital - Benefits To Patients**

Patients deserve the best care possible at all times, especially when undergoing an invasive procedure. Interventional radiologists that are clinically competent and willing to manage patients, provide optimized patient care before, during, and after a procedure. Non-radiologists without sufficient training in image-guided interventions often have a limited repertoire of technical and interpretative skills. They have not been trained to interpret images on fluoroscopy monitors, they often have limited or no training in the proper use of catheters, wires, and other interventional devices, and they lack formal education in radiation safety.

When a physician other than the one performing a procedure tries to coordinate peri-procedural care, there is a potential for errors due to misunderstanding or simple lack of knowledge. Other physicians do not always know indications or proper pre-procedural patient preparation, nor do they fully understand how to clinically follow and manage patients after interventional procedures. A clinically competent interventional radiologist managing the patient minimizes gaps in continuity of care and potential risks inherent in the system of having different physicians performing the procedure and managing the patient.

## **Why Clinical Practice Is Vital - Economic Necessity**

In this era of competition, clinical care of patients is crucial to obtaining direct referrals from primary care physicians (PCPs). PCPs need help evaluating clinical problems and they may not know the best therapy for particular conditions. Currently PCPs often refer patients to surgeons because the surgeon not only provides therapy but will also do the clinical evaluation to determine if a procedure is indicated and if the patient can tolerate a procedure. The surgeon thus also determines which procedure should be done and by whom. For interventional radiologists to receive referrals from PCPs, they need to provide a consultative service instead of waiting to perform procedures that are pre-selected by other clinicians. In an ideal situation, the PCP would refer the patient to the specialist who can evaluate the patient's medical problem and expertly provide the least invasive therapeutic option. The interventional radiologist should be that specialist, but meeting this expectation requires a clinical practice.

Interviews with PCPs conducted during the Society of Interventional Radiology (SIR) strategic planning process revealed that many PCPs do not refer patients directly to interventional radiologists because the radiologists typically expect the PCP to manage the patient for them. When referred for a radiologic intervention, PCPs are often expected to order the pre-procedural labs, arrange hospitalization (including pre-certification), manage the patient while in the hospital, and provide the follow-up care after discharge. On the other hand when a PCP refers a patient to a surgeon, the surgeon handles all these clinical management issues thus relieving the PCP of that burden. In an environment in which non-radiologists can perform image-guided interventions, interventional radiologists that do not provide clinical service are less likely to receive referrals from PCPs. As a result, patients may have image-guided interventions performed by less qualified practitioners who lack formal training in image-guided interventions. This is not optimal patient care.

Failure to provide clinical care has caused loss of revenue through other means besides just loss of referrals. Some of the codes for interventional radiologic procedures have been undervalued relative to the amount of peri-procedural care that should be provided. This is because the RUC has not been convinced that interventional radiologists actually provide any peri-procedural care (personal communication from Robert Vogelzang).

## **Current State of Clinical Practice**

Although the ACR previously passed a resolution supporting clinical practice for interventional radiologists, the spirit of this resolution has not been taken to heart. There is also a disconnect between radiology groups theoretically supporting clinical practice and actually providing the resources to develop a clinical practice. Results of a member survey done by the SIR revealed that only 50% of interventionalists feel that their group is supportive of a clinical practice and only 42% indicated that their group provided any time or space for seeing patients not undergoing procedures. A clinical practice cannot be developed without having time to see patients or a place to do it.

## II. GUIDELINES FOR RESOURCE ALLOCATION

### Introduction

This document is for the development of a clinical practice in interventional radiology and interventional neuroradiology and is offered as a guideline when creating a service that is committed to offering global patient care that goes beyond the angiographic suite. This includes the establishment of both inpatient and outpatient clinical services. Recommendations will include the minimum requirements concerning staff, clinic space, time dedicated toward clinical duties, equipment needs, clerical services, and continuous quality improvement programs.

The need for such guidelines comes as result of the onslaught of competing specialties that have gained access to imaging systems, thus affording the previously referring physician specialists the opportunity to compete directly with the interventional radiologists and interventional neuroradiologists (collectively IRs). This occurs despite the fact that competing specialists may have received far less training and experience than the typical IR. This change in practice pattern is primarily facilitated by the fact that the clinical practice of the former referrer (i.e., surgeon, cardiologist, cardiovascular surgeon) has traditionally been the point of entry for the patient needing additional subspecialized care. In other words, patient control and not quality of care is what most often drives the shift in referral patterns from the IR to the other competing specialists.

If the IRs are going to truly compete with the other specialties offering like services, then they must create the same point of entry within their practices. They must create a clinical service that can accept patients in both the inpatient and the outpatient settings. The clinical practice is the corner stone of every other specialty that offers patient care and should be similarly regarded as a critical component of any interventional practice. Unfortunately, as a subspecialty of radiology (a specialty offering primarily diagnostic services) the many therapeutic treatments offered by the IR have been treated as just another diagnostic study with decisions concerning the type and appropriateness of certain interventional procedures made by physicians other than the interventionalist. This paradigm continues to undermine the ability of interventionalists to control the destiny of their practice. The future success of any interventional practice will therefore be dependent on the ability of the specialty of radiology at large to help change this practice pattern. This is best accomplished by recognizing the absolute need for the development of complete clinical services within these interventional subspecialties.

Creating a clinical practice primarily dedicated to the evaluation and management of patients before and after the provision of procedural services (or in some cases independent of providing any imaging or interventional services at all) in a specialty otherwise largely focused on the provision of imaging services has its obstacles. In order for the clinical interventional practice of the future to flourish, the current diagnostic mindset of radiology will need to change, and the challenges of creating a clinical practice from scratch will have to be met. This is especially so considering that “traditional” interventional practices included very limited clinical (i.e., non-procedural) services and, as such, the implementation of a clinical service may include steps that could be considered innovative in such an environment. To this end, the following document will

assist in recognizing the basic components and adequate resources needed to establish a successful interventional radiology and interventional neuroradiology clinical practice.

## **The Clinical Team**

Since the need and number of interventionalists in most radiology practices is gauged primarily on the volume of procedures performed, any increase in clinical activity will invariably require increased staffing. Certainly an additional interventional radiologist could satisfy this need. However, there are other alternatives when adding additional staff in order to satisfy increased clinical needs. In fact, one could argue that the typical interventionalist with training split between procedural skills and some clinical duties may be a dubious alternative if the specific goal is to strengthen the clinical aspects of the practice.

For many practices, the use of non-physician practitioners, which include Nurse Practitioners (NP), Clinical Nurse Specialists (CNS), and Physician Assistants (PA), is strongly recommended. These individuals are specifically trained to function in the inpatient and outpatient clinical settings and are specifically equipped with the skills needed to perform the daily clinical duties in accordance with the Evaluation and Management services as described by Medicare. That is to say, these individuals have the skills required to perform histories, physical examinations, and participate with the interventionalist in forming a concise assessment and plan. The clinically oriented training these individuals possess makes them an extremely complementary member of the interventional clinical team.

In addition, the non-physician practitioner can function as a fairly independent member of the interventional team as Medicare and most other third party payers allow them to bill under their own identification numbers for the clinical services they have provided. Furthermore in most settings, the non-physician practitioner can perform minor interventional procedures, which increases the flexibility these individuals add to the clinical team.

There may be differences in the ways a PA and a nursing derived non-physician practitioner (NP, CNS) can practice in the eyes of Medicare, the various state agencies that regulate professional activities, and local hospitals. Further details on the exact differences that govern the various non-physician practitioners go beyond the scope of this document; however, when employed by a radiology group, each of these provider types can function in a very similar, if not identical, manner. As a result, all of these practitioner types should be considered equally viable candidates when looking to strengthen the interventional clinical team.

Nonetheless, in some practices the use of a full-time non-physician practitioner may not be practical, and the clinical duties will then fall squarely on the shoulders of the interventional radiologist. In this setting, the interventional radiologist or interventional neuroradiologist must be given the adequate time to see patients in both the inpatient and outpatient settings. For the smaller practice, this would include 3–5 hours a week for an outpatient clinic and 1-2 hours a day for inpatient rounds and consultations. The precise hourly requirement for such activities and personnel will be based on patient volume.

The addition of a registered nurse can also be considered a potential benefit to the interventional clinical team; however, these individuals clearly have different qualifications when compared to

the non-physician practitioner. These individuals most often are not trained or authorized to provide the types of clinical duties that the non-physician practitioner can provide. As such, they should not be considered a substitute for the physician or non-physician practitioner. The addition of a registered nurse to the interventional team should be considered when there is a need to provide care that is adjunctive to the care provided by the practitioner. For instance, in the inpatient setting they could be responsible for obtaining portions of the history, gathering laboratory values, and speaking with family members. However, in most settings they would not be able to perform clinical histories and physical examinations (H&P) or write daily progress notes, and clearly they would not be able to bill for their clinical services. In the outpatient setting, a nurse can likewise provide important adjunctive care such as obtaining vital signs, drawing blood, and providing educational material, but here again, they cannot provide or bill for evaluation and management (E&M) clinical services.

In summary, the burgeoning clinical interventional radiology service will require additional resources including time and/or personnel. For some clinical practices, time may be all that is required for the interventional radiologist to adequately perform clinical duties. However for most practices, it is strongly recommended that primary consideration be made for the addition of at least one non-physician practitioner. This may prove to be the most prudent and economical manner in which clinical services can be augmented. This is especially true if interventional and imaging responsibilities required of the interventionalist do not afford them the appropriate opportunity to nurture the increasingly important clinical duties required to successfully maintain a stake in the interventional market.

Furthermore, the ability of the non-physician practitioner to provide E&M services independently will help maintain the greatest flexibility and autonomy of the clinical practice. The addition of standard nursing care can be very useful to the interventional clinical practice as well; however, the care that routine nursing can provide should be considered adjunctive as mentioned above.

### **The Outpatient Clinic**

Although an outpatient clinic is most often the last clinical piece to be added to the interventional clinical practice, it should be considered the cornerstone to the future IR clinical practice. This is certainly the case with any other clinical specialty where the outpatient clinic serves as the front door through which most patients requiring elective services enter the practice. Likewise, radiology should view the outpatient interventional clinic as just as vital to the future success of the interventional practice. In the outpatient clinic setting the interventionalist can see new patients in consultation and more importantly, the interventionalist can perform the appropriate follow-up care on the patients they treat allowing the interventionalist to maintain some control over the future care of these patients. Unfortunately as mentioned above, the outpatient clinic is usually the last clinical piece added most likely because the interventional clinic will require the greatest number of new resources including personnel, space, time, and equipment.

The recommended time required to see new patients and provide adequate follow-up care to the interventional patient should be in the range of five to fifteen hours per week. The exact time required will obviously vary depending on the size of the practice. Smaller practices performing

procedures on fewer than 1,000 patients per year should be able to sustain a clinic requiring five hours per week, and larger practices performing procedures on more than 3,000 patients per year will require 15 or more hours of clinic time per week. The total time allotted each patient seen in the clinic should be 45-60 minutes per each new patient and 20-30 minutes per each follow-up patient. These time allotments include the total time each patient spends in the clinic being seen by the physician and other ancillary personnel such as a nurse or nurse practitioner.

Space requirements should include, at a minimum, one examination room that is large enough to accommodate an examination table and two chairs (for the patient and at least one family member). The examination room can be located in any number of locations including the radiology department, a hospital based clinic, another specialty clinic using an office sharing arrangement, or the interventional clinic may be a freestanding entity itself. Although placing the interventional clinic within the radiology department is certainly economical and convenient for the physician, the radiology department can be a confusing setting to the outpatient who is expecting to see the interventionalist in a typical physician office setting and not in an imaging department. Therefore, it is strongly recommended that the interventional clinic be located in a more traditional office setting, which will include a waiting room, receptionist, and typically a more private and confidential setting for the patient. This can be most economically achieved using an office-sharing arrangement within a hospital owned clinic or within another specialty clinic such as a surgical or internal medicine clinic. In any case, the procedure room itself or a bay in the recovery room area are not appropriate venues for the outpatient clinic for many reasons including, but not limited to, patient privacy, economic return on space, and the appearance of professionalism. If the decision is made to create a free standing interventional clinic from top to bottom then additional considerations will have to be made concerning personnel and equipment.

Equipment requirements for the Interventional clinic should include an examination table, sphygmomanometer, stethoscope, hand-held Doppler, and educational material. Additional equipment may be required for the interventional neuroradiology clinic in order to perform the appropriate portions of a neurologic examination. In addition, the examination room should have a sink, and trash receptacle.

Whether in an office sharing arrangement or in a self-owned and operated interventional clinic, a minimum of personnel will be required in order for the interventional clinic to reach its full potential. The suggested staffing includes a receptionist, a clerical person to perform typing and maintain medical records, a non-physician practitioner (a nurse is suggested if a non-physician practitioner is not available), and a physician. Since many start-up interventional clinics will have modest patient volumes, it is important to mention that the responsibilities of more than one position may be filled by a single individual such as a receptionist who also provides typing/dictation services and manages medical records.

### **Admitting Privileges/Inpatient Services**

The ability to admit patients onto the interventional service is of paramount importance when providing comprehensive care to a large minority of the patients treated by the interventionalist. It not only signifies that the interventionalist is willing and able to take the lead responsibility for the patient while in the hospital, it also is an important aspect of a service that will facilitate

direct referrals to the IR. The notion that a physician can take the lead role in treating a patient in the interventional suite but not the lead role in providing care during the remainder of the patient's hospital stay is antiquated and is the single best way to encourage a change in referral patterns from the interventionalist to another physician who is more than willing to admit the patient when providing similar interventional services regardless of his or her specialty.

The number of physicians within the radiology department who provide interventional services and have admitting privileges should be sufficient to provide 24-hour interventional call coverage. This includes managing the clinical problems that fall within the interventionalist's scope of practice and making appropriate referrals when clinical problems go beyond the interventionalist's scope of practice.

In addition, part of the daily duties of the interventional radiologist should be daily clinical rounds. Any patient who is admitted to the interventional service, or has a clinical problem that is being managed by the interventional service in consultation must be seen by the interventional radiologist or by a non-physician practitioner who is under the direct supervision of the interventional radiologist. Furthermore, the interventional radiologist should personally see any patient who is admitted to the interventional service or has a significant portion of their inpatient care managed by the interventional service. This specifically includes patients treated with abscess drainage. The physician inpatient visit can be done in concert with the non-physician practitioner visit. The latter strategy will insure the most efficient use of physician time while maintaining the all-important personal contact provided to the patient by the interventional radiologist.

As suggested previously, the use of non-physician practitioners is encouraged, as this will create a clinical team that makes efficient use of physician time thereby mitigating the increased costs of having the physician perform all of the clinical duties surrounding the care of a patient. This is not to say that the non-physician practitioner is a substitute for the interventional radiologist; however, as stated above there are many clinical duties that surround the clinical care of the patient such as gathering laboratory data, note writing, minor procedures (drain removal, suture removal, etc.), and some patient education that need not be done by the physician when an adequately trained NP or PA is available. Clearly, though, there is no substitute for the time the interventionalist spends in front of the patient, especially when significant and complicated health issues are at stake.

The amount of time that is required for the duties involved with daily rounds and admissions should be between 1-6 hours per day. This time allocation includes the total time spent by the physician, non-physician practitioner, and any other ancillary staff that the interventionalist and hospital deem appropriate. The exact amount of time required will of course depend on the size of the practice and procedure mix. Interventional services performing interventional procedures on fewer than 1,000 patients per year may be able to accomplish daily inpatient clinical duties in one hour, while larger practices treating more than 3,000 patients a year will require 4-6 hours per day dedicated to inpatient clinical duties. The amount of time required will also depend on case mix, with those practices heavily weighted in procedures such as central venous access and hemodialysis access management requiring less inpatient care. On the other hand, practices that include large volumes of procedures such as arterial interventions, chemoembolization, uterine fibroid embolization, and abscess/drain management will generate more admissions and therefore require a greater volume of inpatient care.

## **Noninvasive Vascular Laboratory**

As the role of the modern-day interventionalist evolves in the evaluation, management, and treatment of the patient with vascular disease, so must the noninvasive vascular laboratory. In the initial patient evaluation, a thorough history and physical examination remain the most critical factors in deciding if the patient with suspected vascular disease requires further treatment. The noninvasive laboratory provides additional important diagnostic information that can confirm and quantify the hemodynamic or anatomic problems producing the clinical findings. Timely access to, and reliable and reproducible reporting from a noninvasive laboratory are crucial in the establishment and maintenance of a vascular practice. Here-in lies an additional problem for most interventional services. In many cases, the noninvasive laboratory is the domain of the non-radiological vascular specialist (vascular surgeon or vascular medicine specialist) with little involvement by radiologists. This is despite the fact that much of the technology and interpretive skills are easily within our grasp. With the exception of lower extremity physiologic testing, most vascular studies performed in the noninvasive laboratory (i.e., carotid duplex, renal duplex, mesenteric duplex and vascular graft surveillance) utilize the same equipment that exists in most diagnostic ultrasound departments. In order to provide the full range of lower extremity non-invasive testing a treadmill should also be added. However, this treadmill also could be used for cardiac stress testing if the geographic location of the non-invasive lab so allows. Beyond that all that is lacking are the referring clinicians to order the studies and/or to refer symptomatic patients for evaluation and the commitment of the interpreting radiologist to become involved with the care of the patient.

Once the noninvasive study is performed, the interventionalist must also have the means to provide clinical guidance in the future management of the vascular patient based on these results, allowing the noninvasive laboratory to function as an additional point of entry for the vascular patient into the interventional practice. In other words the noninvasive lab should allow the interventionalist the opportunity to counsel both patient and referring physician in order to demonstrate knowledge in the diagnosis and management of the vascular patient. Thus the noninvasive laboratory can function as an ad hoc vascular clinic, where not only can the studies be performed, but the patient can be seen and evaluated to determine if symptoms correlate with their noninvasive studies.

As a result, it is strongly suggested that all patients, whether new or in follow-up, should be evaluated with some form of a noninvasive vascular study if clinically warranted. This should be done in conjunction with clinical visits when vascular disease is suspected. Therefore the IR clinical service must have access to an accredited (ACR or ICAVL) noninvasive laboratory that is proficient in performing noninvasive studies of the lower and upper extremities, carotid arteries, visceral vessels, and deep venous systems. The access can be by referral outside the radiology department although the clinical advantages described above are improved if the interventionalist is part of the laboratory staff.

The studies performed are often time consuming and the quality of the study depends heavily on the skill of the technologist performing the vascular study. It is this variable, which is often difficult to control, that adds a degree of subjectivity to these studies. This requirement for reliable and reproducible studies can be viewed as an opportunity for the interventional radiologist. As stated above, in most centers the noninvasive vascular laboratory is controlled by

the clinicians with whom we now compete for patients and procedures. But the interventionalist has the opportunity to change the face of the noninvasive laboratory. By developing a new set of noninvasive tests (i.e., MRA and CTA) that can be marketed directly to the primary care physicians and the patients, themselves, the interventionalist can compete in an open-market environment. Although currently these tests may be more costly and time consuming than the standard noninvasive studies, they offer the potential advantage of being less subjective and more reproducible. As technology improves, it is likely that imaging procedure time and cost will decrease. Ultimately, it will be through such advances and hard work that the interventional radiologist will be able to solidify a position in the diagnosis and treatment of the vascular patient.

### **Additional Clerical Services**

Clerical support will also be needed to facilitate scheduling of procedures and additional clinic visits, insurance authorization, and billing of procedures and E&M services. In most radiology practices outpatient minor procedures can be billed using the same mechanisms employed for the billing of inpatient procedures. E&M services can be billed using these existing services as well; however, in order to accurately bill E&M services the interventional team must learn a system that will, in most radiology practices, be unfamiliar. Mastering this system will therefore take an initial dedicated effort that will require educational and time requirements.

E&M services are non-procedural services that include all face-to-face clinical duties. Almost all of the increased clinical work performed in a burgeoning clinical interventional service should be performed and documented in a manner that substantiates the billing of an E&M service. Other clinical specialties think it inconceivable to perform clinical duties and not to appropriately bill for E&M services. The interventional radiologist should be no different, and therefore the interventional team must receive the education necessary to successfully understand the Medicare E&M system. Resources must be made available to code, bill, and be reimbursed correctly. This requires someone with the expertise to ensure that coding is in compliance with local and national requirements, reports accurately document the work provided, codes with correct modifiers and codes for clinical indications are submitted to insurers, and that payment has been received. If this expertise is not available locally, this part of the billing operations may need to be contracted out to a competent consultant.

Furthermore, space and a system to organize and store outpatient medical records must be available, either in the clinical space itself or easily accessible to the clerical personnel.

### **Quality Assurance**

Maintaining and improving quality is a corner stone of all of the standards programs of the ACR. This optimizes patient care and is also required by the JCAHO. Individual physician outcomes data is also necessary for the granting and maintaining of physician credentials. Outcomes data are also important as a means to inform referring physicians of the benefits of referring patients to interventional radiology and neuroradiology.

The ACR, in collaboration with subspecialty societies such as the SIR and ASITN, has written quality improvement standards for interventional radiology and neuroradiology procedures. These standards have three basic components: the procedure should be done for appropriate indications, should be done successfully, and should be done safely. In the ACR quality improvement standards each of these components is assigned a threshold. When indications or success fall below the threshold, or complications rise above the threshold, a review should be performed to determine causes and implement changes, if necessary.

The overall quality process has several steps.

1. A practice should identify which procedures it chooses to track.
2. Thresholds should be determined. In an environment where multiple different specialties perform the same procedure, as occurs with interventional procedures such as arterial interventions, multispecialty agreement on the thresholds is essential. The ACR standards are based on national data and should apply to most practices, although practices can tailor the thresholds based on patient mix.
3. A process is necessary to track both short and long-term outcomes. The current ACR quality standards deal with technical outcomes. To determine if the patient has clinically improved and the durability of improvement, long term follow up is required, which the interventionalist is able to obtain by seeing patients in follow up in the interventional clinic.
4. Quality outcomes are analyzed in a regular forum. This may be in a monthly or quarterly quality assurance meeting or report.
5. There must be actions designed to improve quality if a problem is identified.
6. Quality must improve.

The following resources are necessary to implement an effective quality program:

1. A practice must have a computer with a database that can track procedure and outcomes data. One such database is the SIR HI-IQ™. Others are available.
2. Someone must be responsible for entering the demographic, procedure, and outcome data. This may be a shared responsibility between clerks, nurses, physician extenders, and physicians.
3. Information on long-term follow up must be obtained and entered.
4. Time must be available for regular analysis of the quality data and implementation of quality improvement actions. More time is needed to set up the process at the beginning. Depending on practice size, it is estimated that 1-3 hours/week of clerical time is necessary for data entry, assuming that about 5 minutes per case is necessary for data entry. One to three hours per month are necessary for data analysis.

### **III. FUTURE DIRECTIONS**

#### **Considerations for the Future of Imaging Guided Interventions: Is There a Return on Investment?**

Imaging-guided (minimally invasive) interventions (IGI) have made and continue to make a vital contribution to the care of patients. The frequency with which IGI services are provided is increasing, as is the complexity of the services. Traditional, more invasive, alternatives are being replaced by these more minimally invasive procedures at an accelerating pace. There is no doubt

that such services are here to stay. At question is the role of radiology practices, radiology departments, and radiologists in the provision of IGI. This document has described the necessary clinical attributes that support the provision of IGI. It is clear that providing these attributes requires the investment of time, resources, and dollars. Why should the contemporary radiology practice make such investments? There are multiple reasons, and all are important.

First, interventional radiology is an integral and major component of the House of Radiology. The council of the ACR and the membership of the SIR have both stated this emphatically. Therefore, this major component of the House of Radiology must receive the same level of support as any other facet of our discipline. One would never debate the need for high quality CT, MR, or US equipment and resources and technical personnel, for example. The clinical resources necessary to provide IGI are no less important to this major imaging discipline than are the technical resources necessary to provide high quality CT, MR, or US to those radiology disciplines. Lack of these basic necessities is tantamount to excluding IGI from the scope of services offered by the radiology practice and/or department.

Second, as stated above, IGI is here to stay. It is being demanded by referring physicians and patients alike. If high quality IGI services are not provided by well-qualified and properly supported interventional radiologists, these services will be provided by other practitioners – perhaps with or without similar training, experience, and qualifications. This may detract from the quality of patient care. Furthermore, as the resources that are necessary for such services are shared among an increasingly diverse pool of practitioners, it is likely that the efficiency of the resource utilization will suffer. In most settings, it will still be the radiology department and the radiologists who will need to oversee these procedure resources, even though the radiologists will be providing an ever-decreasing fraction of the services. This procedure area oversight will likely not be a reimbursable activity, or at least not reimbursable without contention within the institution.

Third, there is positive financial return derived from both the provision of the IGI itself and the associated clinical services. In addition, there is positive financial return from the associated secondary imaging services. There should be an expectation that as the IGI services themselves leave the realm of radiology, there will be a high likelihood that the secondary imaging services will also be at jeopardy.

Fourth, it is likely that competitors will pick and choose those IGI services that are appealing from intellectual, technical, and economical points of view. There will likely continue to be some IGI services that are left behind for the radiologists. As the volume of the more “appealing” services decline, it will be likely that well-trained interventionalists will not be attracted to remain in the practice and/or that such individuals as do remain will lose their technical skills. This will create either recruitment problems, risk exposure, or both.

Fifth, the field of IGI is undergoing a transformation. Within the next several months to years it is very likely that IGI will be provided in freestanding facilities and office settings. This transformation will provide significant opportunities for improved access to patients. There will also be significant opportunities for providers of such services – whatever their specialty of origin might be.

Currently, non-radiology specialties have access to offices, in which they can see patients, maintain clinical records, and also have access to ambulatory surgery centers with recovery rooms. On the other hand, many radiology practices have experience in implementing outpatient imaging centers and offices. Those practices that have until now been entirely hospital-based, still have experience in the implementation and management of imaging facilities and will likely have willing partners in the form of their institutions. Such free-standing imaging centers and offices often include the provision of CT, US, and fluoroscopy. Some of these are also located in medical office complexes that include nearby space to see patients (albeit not usually rented or owned by the radiology practice itself, but available nonetheless). Some of these office complexes also include ambulatory surgery centers and recovery facilities. There will be competition to provide IGI in these free-standing sites of service. Which specialty will lead and which specialties will follow? It could be radiology that leads. It need not be, however.

Sixth, IGI is constantly changing in the introduction of new technologies, in its ability to provide minimally invasive therapies for new disease states, and also with regard to the turf battle of the day. The well-trained, clinically oriented interventional radiologist is able to provide a broad range of imaging guided, percutaneous and intra-vascular therapies with anatomic and disease state diversity. Non-radiology practitioners tend to focus on only certain techniques, certain anatomies, and certain disease states. While in some ways the diverse nature of interventional radiology might be viewed as a negative, it is a strong positive from the standpoint of the fiscal effect of the aggregated clinical volume. This ability to aggregate procedural volume from diverse sources defrays the cost and maximizes the return on investment on the clinical and technical support necessary for the provision of these services. The radiology practice is in the best position to take advantage of this fact – but only if a critical volume of services remains within the practice. Therefore, the time to act is now before it is too late.

Finally, in some practices there has already been erosion of IGI service volume as others have entered this field. The investment in the necessary clinical resources described herein will allow a more vigorous competition in order to regain lost volume or at the very least to minimize further erosion. However, as stated immediately above, interventional radiologists are not “one trick ponies.” There are numerous clinical and anatomic potentials for the provision of IGI. The aforementioned clinical resources will also support initiating the provision of IGI in these alternative conditions and anatomic sites; and defending this new business as it will undoubtedly be challenged by other specialties in the future. Just as in other forms of investment, it is important to diversify. Such diversification helps to ensure your return on investment and the long-term well being of this major component of our *House of Radiology*.

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