

**A MODEL FOR PHYSICIAN QUALITY REPORTING:
A CASE STUDY BASED ON PQRI**

An ICLOPS White Paper

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ABSTRACT: PQRI as a Foundation for Physician Quality Measurement

The Medicare Physician Quality Reporting Initiative (PQRI) began on July 1, 2007, for an initial six-month period. Details of this program are well explained at the CMS website <http://www.cms.hhs.gov/PQRI/>. PQRI is an ambitious effort to quantify clinical services according to a set of standards that include both process and outcome measures. Its initial phase is based upon reporting of quality data through special CPT codes. Because this is the first time both clinical quality standards and a universally applicable collection method have been deployed, PQRI paves the way for private insurance quality payment of physicians. Therefore, this "Value-Based Purchasing" effort will have a high impact on providers. The purpose of this paper is to examine the impacts of PQRI reporting and design a model for the evaluation of physician quality that is comprehensive and fair.

At this writing many physicians are not fully aware of PQRI, and most are skeptical about it. While there is much political activity that will need to occur in order for the program to achieve a permanent status and reimbursement structure, quality measurement of physicians (and other health care providers) is certainly here to stay.

As this paper will show, the ability to measure physician quality through the use of data is based on several assumptions. The first is that patient conditions are accurately reflected in claims or system data. The second is that physicians have the capability and willingness to code quality services, and have a system for identifying patients who need PQRI coding. The last premise is that measurement of quality will be the basis for improving patient care.

Many physicians and health care administrators believe that an Electronic Medical Record (EMR) will solve the problem of quality coding and measurement. This assumes that the EMR will include a complex patient registry process to support the measurement of eligible patients for each PQRI quality measure, as well as commercial Pay for Performance measures. For reasons described in this paper, it is unlikely that physician practices with EMRs can manage the process of registry maintenance and updates, or that the EMR vendor will. As this paper will show, there is a distinct registry function that is likely to co-exist with EMRs and become mutually supportive in maintaining patient-specific and payer-specific quality requirements.

ICLOPS is a hub for physician quality information. ICLOPS clients are Independent Practice Organizations (IPAs), Physician-Hospital Organizations (PHOs), large physician groups, and individual physician practices. All are trying to respond to market demands for quality or would like to participate in Pay for Performance contracts. ICLOPS has implemented clinical quality projects across networks and in independent physician practices. Over the past 5 years ICLOPS has collected and analyzed data from multiple physician source systems and used Category II or other codes to measure outcomes and processes. The experience of ICLOPS is instructive in optimizing PQRI and similar Value-Based payment reimbursement methods. In this paper we present the issues relevant to physician quality measurement and propose a model for a multi-faceted quality measurement process.

Issues in Physician Quality Measurement and Claims-Based Reporting

There are many aspects of the initial structure of PQRI. These issues already influence the voluntary participation of physicians and, as physicians are required to submit clinical quality data over time, these issues will impact their quality "scores". It is critical that a model physician quality process address these issues to ensure valid physician quality measurement. Described are a number of areas where ICLOPS experience in physician quality management has issues that affect design of systems.

1. Source data used for physician quality measurement (usually claims data) is initially flawed and must be modified. Billed claims data, which is the source of patient clinical values used in PQRI, presents a rich and important foundation for quality measurement. It is more readily available, more reliable, and more complete than data obtained by input from the practice. It involves little if any work from the practice to retrieve and make usable in a central database. The data reveals patient age, co-morbidities, visits, diagnoses and procedure codes over time. With the enhancement of Category II codes, G-codes, and other procedure codes, it is an excellent base for analysis of physician quality. ICLOPS has used this data from its inception and has found it to be invaluable in establishing an initial quality process.

The data cannot be used without careful validation, however. In particular, incorrect diagnosis codes can result in patients being mistakenly coded as having chronic diseases or other conditions which make them eligible for PQRI measures. ICLOPS' "Iris" patient registry was originally created as a validation mechanism for physicians. Using this application, physicians can correct the current status of patients in the practice as well as remove patients from PQRI registries because of prior miscoding.

2. Measuring quality has a significant effect on physician quality reporting. ICLOPS' experience in practices using quality codes indicates that there is a substantial impact on behavior when physicians perceive themselves as being measured. For example, physicians appear to be quite concerned about reporting poor control of diabetes. Even when physician prompts are pre-positioned in eligible patient charts, ICLOPS experience is that physicians opt for not reporting codes of patients with poor management of HBA1C levels or blood pressure. However, when the patient has good control, the codes are reported. Even when physicians may ultimately be penalized for not

reporting, they seem to make a choice of delaying the reporting in an attempt to affect the patient's results prior to the next visit. This is confirmed by anecdotal reports from physicians who are using ICLOPS' physician prompts to report quality codes.

Although PQRI rewards physicians solely on the basis of reporting, most physicians believe they will ultimately be reimbursed based upon the results (i.e. a good outcome or the performance of some action). This means that the action of reporting the result is important in the process -- a variation on the Hawthorne Effect, which has shown the influence of observation on the end result. Measurement awareness has also been shown to influence physician behavior in other areas, such as prescribing of antibiotics.¹

3. PQRI's physician-centric measurement makes it more difficult to track quality coding in practices with more than one physician, especially primary care. An important feature of PQRI is the fact that the individual physician is measured for his or her actions. Unlike most EMR systems and standards that focus measurement on the patient, PQRI measures the physician. This is a necessity of PQRI because of the difficulty in determining patient attribution, and because the system depends on claims-based reporting. It is also a policy decision to ensure physician responsibility in the review of patient results, regardless of who the primary physician is.

The impact of physician-centric coding is that multiple physicians may get credit for reporting the same quality code for the same patient, but one physician in a group practice will not get credit for a colleague's coding of a patient seen by both physicians. The scoring for performance will be based upon the National Provider Identifier (NPI). Because many of these measures only have to be reported once per reporting period (the initial term is six months), there will be duplicate reporting of codes each time an eligible patient is in the office. With a proposed increase in future measures, the volume of physician coding work will be substantial.

To accommodate individual physician reporting requires a method of tracking prior coding by each physician for each patient, or to require that each eligible patient be coded for every visit. ICLOPS has accomplished this by two methods. First, ICLOPS provides practices with the ability to securely generate and download patient-specific

¹ Mangione-Smith, R., Elliott, M.N., McDonald, L., McGlynn, E.A., "An Observational Study of Antibiotic Prescribing Behavior and the Hawthorne Effect," Health Services Research, December 2002; 37 (6): pp. 1603-1623.

physician prompts through the ICLOPS website; second, ICLOPS registry-reporting tracks the fulfillment of required reporting for each patient and physician, so that physicians need only code what is due. CMS will not permit registry reporting for PQRI until 2008, so Iris generates paper prompts for PQRI, while permitting registry reporting for other quality projects.

4. Code capture difficulties under PQRI will make successful completion difficult, and therefore affects accurate measurement results. Medicare adopted claims-based reporting because it poses no absolute barrier to the participation of any practice. The data is readily captured by CMS through the payment process, and reporting – not results – can be the initial focus. The reality is that achieving success (which is reporting on 80% of patients for three quality measures-fewer if fewer measures apply) is not going to be so easy, and it is an all or none option. Practices are likely to attempt to fulfill only a few of the measures for obvious conditions, such as patients with diabetes. Additionally, the identification of patients who are eligible for quality code reporting during or prior to office visits is a complex process. Even though a patient may be targeted for reporting, without a systems approach, it is unlikely that the physician will remember and code the data during a visit.

ICLOPS resolves the difficulty of identifying eligible patients by analyzing physician system data and placing patients in patient registries according to set criteria. Physician prompts are then generated according to each patient's registry eligibility and pre-attached to encounter sheets or pre-placed in the charts for coding during the next visit.

5. Practices with Electronic Medical Records (EMRs) may have a more difficult time with Quality Reporting. ICLOPS' experience is that it is extremely difficult it is to add to any physician workload that must be accomplished during an office encounter. ICLOPS has experience with many practices and using multiple EMRs who must code quality data. This is an area of great difficulty for several reasons. First, few EMRs have the inherent capability of translating collected clinical data into the PQRI codes. This is particularly a problem when the practice EMR and billing system is not integrated, which is frequently the case. Even when the practice has an EMR, it is often used by physicians with free text, without using fields that enable easy retrieval of the data.

Second, the EMRs do not track the reporting of individual physicians, but generate templates or lists from the perspective of the patient. This means that merely having documentation within an EMR that a certain process occurred does not mean that it will automatically be attached to each physician within the group who may have the patient assigned to his/her denominator for that measure. If more than one physician codes so that the patient is included in multiple physicians' registry denominators, then each physician will need to report the appropriate PQRI measure code in order to meet the criteria for reimbursement in the program.

Some EMRs have attempted to address this through a pop-up alerting system, which occurs when the appropriate ICD9 code and CPT code or even just the age of the patient triggers a pop-up reminder to code the appropriate Category II or G code. The value of this approach is that each physician who meets measure denominator criteria may code for the PQRI measure. The problems with this approach include:

- Duplicative entry of codes in a reporting period for the individual physician (e.g. each time a 67 year old patient comes in, a pop-up for falls assessment will be shown)
- Entry of billing codes may happen after the patient has left the office because entry of ICD9 and CPT codes occurs at the end of the visit,
- The physician's workflow is altered because he/she may need to ask the patient a question or order a test or referral (and document this) after the visit is presumed to be completed
- Sequential pop-ups will be required (for the measure tracking the use of beta-blockers in heart failure, a code for ejection fraction of less than 40% must be entered prior to any code for use of beta-blockers); this will pose a burden during such a time-pressured period as the office visit

Busy practices frequently avoid the use of templates or alerts, and in ICLOPS' experience, physicians resist anything that adds to their workload during a patient encounter. This is likely the reason why a recent study found EMR use was not associated with any better quality ambulatory care.² Therefore, there is little scalability

² Linder, J.A., Ma, J., Bates, D.W., Middleton, B., Stafford, R.S. "Electronic Health Record Use and the Quality of Ambulatory Care in the United States," *Archives of Internal Medicine*, July 9, 2007; 167 (13): 1400-1405.

to adding more than a few PQRI measures because more than one or two pop-ups will slow down patient flow to the point of being unacceptable to the physician.

Physician Quality Coding and the Promise of Registry Reporting

Claims-based quality code reporting offers a foundation for the initial process of collecting data, but poses too many difficulties for the establishment of a comprehensive quality measurement system. The demands of an ongoing program require methods deploying data more intelligently and with less work or confusion.

A sustainable quality reporting process has two essential features. First, it minimizes the workload on physicians, especially during the patient encounter but also in total. Second, it allows for a simultaneous validation of data so that the correct patient denominator is being measured for each physician. Physicians will ultimately reject a reporting system lacking either of these two conditions. Over and over in ICLOPS' engagements with physician organizations, these two principles have emerged as paramount for the participation agreement of member physicians.

CMS is making plans to move toward patient-registry reporting, which would free up physicians from having to report the codes as part of the patient encounter or procedure recording. This will be essential for specialties where the quality codes cannot reasonably be attached to the claim at the time of submission. Under the current pilot, an emergency medicine physician must submit the code for whether a patient presenting with syncope received an EKG on the claim for that patient. Likewise, a surgeon's office billing system is separate from the hospital where the service occurs and the quality information would be generated.

The CMS-allowed registries will reflect the criteria for patient eligibility in PQRI, which may include a combination of ICD9 codes, CPT codes, age ranges, or gender specification. Codes submitted through "data submission vendors" (DSV) will be the same as that which may be submitted through the quality codes, and may take place after the claim is submitted to Medicare. This creates the opportunity to enhance the yield of the reporting, and to explore how quality reporting may be better handled outside of the physician-patient encounter.

Registry reporting will be very important for practices with EMRs, which may easily check patient records without having to pull charts. Incidentally, the greatest cost saving with the adoption of EMRs is for reduced chart pulls.³

³ Grieger, D.L., Cohen, S.H., Krusch, D.A., "A Pilot Study to Document the Return on Investment for Implementing an Ambulatory Electronic Health Record at an Academic Medical Center," *Journal of the American College of Surgeons*, July, 2007; 205 (1): 89-96.

An Integrated Model for Turning Data Collection into Quality Management: A Case Study of ICLOPS' Iris

Transforming physician quality measurement into better patient care is an advanced prospect that the current PQRI pilot (ultimately) anticipates. Efforts to measure and report quality data will not create a systematic improvement in patient outcomes, however, regardless of financial incentives, unless they are integrated into a quality management process that engages the physician with his or her patient clinical data. This extends beyond improving the method of reporting. It involves the development of a system that involves physicians beyond the coding of patient services.

Physician awareness and engagement in the PQRI process is crucial for its success. A passive program that captures the information and reports it back to the physician in an aggregate fashion distances the physician from the details of the program and the involvement of specific patients. Whether at the time of the visit or in a post-visit registry reporting, the physician needs to plan to correctly address the measure in the future for each patient not meeting optimal reporting requirements.

For ICLOPS, one of the most rewarding aspects of working with physician quality comes during the first review of clinical data with physicians. When physicians become aware – usually for the first time – that they might be able to actually affect outcomes through an overarching data-driven process, they begin a process of transformation. Most physicians enjoy the possibility of reviewing their patient data, especially on-line. They become very involved in the details of their patient data.

For such a process to engage physicians, however, it must have features that encourage the physician to repeatedly review, reference, and change the data.

A Review of Iris

ICLOPS has a claims-based patient registry already in operation for its physician organization clients. "Iris" identifies each patient according to PQRI criteria or other each clinical quality project criteria, and provides the capability for physicians to review patient data securely on line.

Iris has evolved over several years in response to client needs, and has now become the centerpiece of all ICLOPS clinical quality projects. As a result, ICLOPS has now developed criteria for patient registries that are used for quality management purposes.

1. Patient Registries must be equipped with a capability of validating and modifying registry data. An important capability in Iris is its ability to be validated and modified to maximize its accuracy. ICLOPS has found that registries derived from claims data need to be reviewed before they are acceptable to physicians for measurement purposes. The physician must have the ability to remove patients from the physician's registries for various circumstances. For example, if a patient is not managed by the physician for the measured condition, does not actually have the condition being measured, or has another overarching medical condition which would make inclusion in some registries inappropriate (e.g. advanced Alzheimer's Disease), Iris allows the physician to remove the patient from the specific registry.

Iris also allows modification of the active status of the entire patient (for example, if the patient is deceased or dismissed from the practice), thereby removing the patient from reporting requirements. Because ICLOPS frequently manages correspondence from the physician to registry patients as part of clinical quality projects, Iris also allows practices to change the patient language or mailing appropriateness for each registry's patient.

ICLOPS learned the importance of registry validation through the process of patient communication management. When raw registries were used for mailings to patients, even after review by the practice, a small percentage of patients called their physicians demanding why they were incorrectly labeled with having asthma or diabetes. The source of errors included coding mistakes and inappropriate coding of conditions to cover payment of tests. In some cases the patients were not aware they had the conditions. Patient communication is a usable means to validate the registry. On principle, having patients view the results of quality codes submitted for them may be an appropriate means for validating services as well as reinforcing physician instructions.

2. A quality management process should alert physicians on patients who have not met process measures, as well as analyze patient adherence factors. Current PQRI measures

favor process over outcome (or intermediate outcome, e.g. LDL level) measures. Process measures are a more direct measure of the physician, but are not as powerful as outcome measures. The future scenario will likely include both an increase in control measures and a link between real events with process measures, as described below.

Control measures have the disadvantage that they are strongly influenced by patient actions. If physicians feel trapped, they will likely dismiss patients with poor outcomes or poor adherence. This will not be politically acceptable, as underserved communities and the physicians serving these communities will be disproportionately and negatively impacted.

In addition to identifying patients who refuse tests or treatment regimens, registries can be used to measure patient adherence. ICLOPS computes a Visit Adherence Index for every chronic disease patient in Iris, and displays the VAI along with other patient information. The VAI can be used in adjusting some of the process measures, and at a minimum it is an important indicator for the physician in reviewing the registry data itself. A VAI must be tempered by the ability of the patient to obtain a visit with the physician in a timely manner. In other projects, ICLOPS has computed patient use of education modules and correlates their use of these modules with complications and patient satisfaction.

Process measures that are linked to certain outcomes (e.g. peri-operative antibiotic use and post operative wound infection) will ultimately create consequences for physicians. It is not unreasonable to expect that payers, including Medicare, will use adverse outcomes and compare them to physicians who do not report on the measure or who do not perform the process (without a modifying reason which is also included in a number of the quality codes). As episodes of care are measured, this might be a mechanism for financial penalties.

The use of individual physician measurement makes the process of alerting physicians about poor patient behavior more difficult. In one study of patients with Type 2 Diabetes, patients seen for chronic disease follow-up visits were 4.8 times more likely to receive 100% of five recommended services compared to encounters for an acute

illness.⁴ Quality management systems identify patients when there is lack of reporting and coding. This may include patients who do not return to the office, or who visit for acute care but never schedule additional time to allow the physician to address management of the chronic condition or preventive care.

3. A quality-focused patient registry should be able to collect claims data from a variety of different systems, and provide a mechanism for direct secure input by the physician. These will include the ability to access prescription information and laboratory values that are part of an EMR.

It confuses many physician organizations that EMRs cannot fulfill the needs of a patient registry, and especially enable “clinical integration” or measurement of physician quality processes among multiple physicians. Many physician organizations have argued for a one-stop solution to both technology and quality management, and believe that since an EMR contains the clinical history of individual patients, it should also be able to manage group processes.

This is overly optimistic. No one would argue that a billing system could address all aspects of the financial part of the practice – such as the management of managed care contracts or the modeling of yields under such contracts. Likewise, each Pay for Performance agreement or payer quality management system, such as PQRI, will change at least annually and will likely not have every protocol or measure in common with others. This means that there will be a substantial task in organizing patient registries to accommodate multiple criteria, and ensure the tracking of the “numerator” or measured activity or outcome, for each registry.

Both registries and EMRs have distinct and important functions in patient quality. EMRs can work effectively to collect individual patient clinical data obtained during the encounter and also hold laboratory data. The creation and maintenance of multiple patient registries is possible with a registry-generating multi-dimensional database, with uniform rules for registry generation and an organization focused on this process. EMRs data collection is not standardized, and their implementation by practices is certainly not

⁴ Parchman, M.L., Romero, R.L., and Pugh, J.A., “Encounters by Patients with Type 2 Diabetes – Complex and Demanding: An Observational Study,” *Annals of Family Medicine*, 2006, 4: 40-45.

standardized. This will prevent EMRs from being an immediate source of uniform quality data.

It will be necessary to collect data from the EMR in order to maximize the value of a patient registry for physicians. However, the patient registry will represent a unique process of collecting a variety of patient information – even from the patient – that will extend beyond the capacity of an EMR.

ICLOPS' Iris is a good example of how this will work. Already Iris manages the grouping of patients into registries according to both IPA clinical integration projects and for PQRI. The registries are different because the denominators of patients to be measured may differ by age, diagnosis, or procedure code. Likewise, the actions required and the reporting frequency varies. While PQRI requires annual reporting, some clients require more frequent reporting of control values in order to assess clinical improvement.

4. The effectiveness of quality management will depend on a single quality reporting process that accommodates multiple payers and needs. The complexity of any quality reporting process for physician practices means that only one process is likely to be used by a practice. Different payers have come up with pay-for-performance programs using different measures and mechanisms for data capture. It is most likely that as the CMS program works through its initial phase-in, that other payers will “jump on the bandwagon”.

Using a single program means that the entire population of a practice is included in the measurement process. This is extremely important, as one of the major drawbacks of early pay-for-performance programs has been the small numbers of patients with a given condition under any given payer within a practice or by physician. It is also to the advantage of CMS to have other payers adopt the same measurement process, as physicians will not try to “escape” Medicare if other payers are emulating the quality program.

For payers other than Medicare this offers some real advantages. If physicians are following these measures, health care costs should decrease, and there is in reality little in the way of market differentiation between payers on physician quality programs. The

same physicians are treating patients with different health plans (with some exceptions). Patients do not really trust health plans, and the film "Sicko" is not going to improve that perception. Patients don't believe their payer is trying to improve their care so much as maximize profits. Physicians have the opportunity to engage patients in the process and improve care.

5. A good quality management process should integrate measures to elicit patient feedback and increase patient responsibility and involvement in care. This feedback should become part of the registry so that physicians can access information from patients and view it while reviewing other aspects of the patient's status.

Patient satisfaction surveys have been a misused component of assessing physician quality. They have been either too general, or were used by third parties to promote a kind of "popularity-contest" of quality. In the context of developing an integrated approach to quality, however, patient feedback is essential.

A higher order of patient-based data has been used by ICLOPS in several different ways. The future of patient communications is to combine clinical data with the evaluation of the efficiency and effectiveness of physician care, such as:

- To assess the effectiveness of the physician to influence and impact upon health behaviors.
- To determine if there are delays in getting an appointment for ongoing care. This will modify adjustments using visit adherence as a factor for measurement adjustment.
- To examine barriers to treatment that should be addressed by physician organizations.
- To compare with physician-generated quality coding. For example, if patients report the physician does a poorer job of communicating to them about their illness, and the physician reports a higher than average number of 2P modifiers (patient reason for a measure not being completed), then this would be additively measured to reflect a problem with the measure result arising from the physician's actions or lack of action.

Iris' results of the quality measures are compared with patient feedback on physicians. Adjustments to physician reports and results from the quality codes (e.g.). of surveys

will be posted online, initially aggregated but ultimately at the individual physician level. In addition, Iris allows physicians to see patient-identified responses. For example, a physician may view the results of a treatment barrier survey while reviewing the Visit Adherence Index for the selected patient, so that the perspective of the patient is more clearly understood in reviewing the patient's management.

Another aspect of patient engagement is patient communications. ICLOPS experience with this has been substantial, especially in the distribution of letters and MedCards to patients with chronic disease so that they can understand the need for regular exams and tests. Physicians report that patients are very positive about the letters, and in particular elderly patients bring the MedCards to the appointments. In some cases, the letters have been effective in initiating screening tests such as colonoscopies for patients who were otherwise avoiding them.

Physician offices need to capture this information in an organized form, and to make sure that communications are used that will be understood by patients. This includes making sure that communications may be sent in appropriate languages for the patient population in the practice. ICLOPS has observed that practices are increasingly capturing email addresses of patients. This allows a less costly means of reaching out to subpopulations in the practice. This is not to say that practices wish to increase uncompensated dialogues with patients, rather the emails will direct patients (or family or friends of the patients) to secure websites to answer questions to expedite future visits and to enhance quality interventions.

Patient communications should be combined with registry reporting to enhance improvement in outcomes. For example, for a sub-registry of diabetic patients with an LDL of greater than 130, letters can be mailed to these patients directing them to a secure website with a login. The patient would respond to a brief questionnaire ascertaining the existence of certain barriers to medication adherence, belief in the need to lower LDL levels, and lack of resources to pay medication co-payments. Once the results of the questionnaire are analyzed, the registry then identifies the patient surveyed and presents key results.

Patient communications resolve cases where a subsequent visit will be necessary in order to complete a required process. For example, a physician discovers that she has not asked a 71 year old female patient about falls in the prior 12 months, when presented by an alert in Iris. The physician could submit a code to get credit, but the preferred action is for the physician to ask the patient about falls at the next visit. Iris reminds the physician after the next visit to report on the falls question or to identify that the patient has not returned to the office in the expected time period. A letter requesting that the patient schedule the visit is then sent.

Communications to patients with chronic diseases help to improve the number of planned visits, and with self-management of the condition by the patient (which has been associated with improved outcomes in patients with chronic conditions).⁵

6. Reporting back to physicians is an essential component of patient registry functions. ICLOPS' Iris has an online report access for physicians to allow them to review their results.

As CMS accumulates data from the PQRI program, some questions will inevitably arise from analysis of the results. Some physicians are going to have much higher reporting with one or more of the modifier codes (1P, 2P, 3P, or 8P). What this means will be uncertain, but attempts to answer this will likely be needed. Physicians who find themselves as outliers will want to know why. Iris will assist physicians by identifying these patients and providing a structured means of assessing or at least capturing a sample of this subset to determine more detailed reasons for use of these codes. For example, a physician who has a large percentage of 2P modifiers may wish to clarify that patients are refusing a medication for cost reasons, or religious reasons. Understanding this subset of reasons will be valuable both for the physician and for CMS.

It is also likely that certain measure results will be used as a stepping off point for more quality reporting. If a physician reports a patient has fallen at least twice in the

⁵ Coleman, M.T. and Newton, K.S., "Supporting Self-Management in Patients with Chronic Illness," American Family Physician, October 15, 2005, 72 (8), pp. 1503-1510.

preceding 12 months or has at least one fall with injury, then for this patient what was done to properly investigate the cause and/or initiate appropriate therapy or referral? This is a good example of where registry reporting may allow this type of follow-up reporting to occur. Outcomes measures may be more accepted if the physician may supply information that would modify the results, such as if the patient is morbidly obese (for diabetic outcomes) or if the patient was at particularly high risk (for surgical outcomes). It may well be that such measures may be more narrowly focused and thus pose less of a reporting burden upon the physician.

The importance of certain measures will also be influenced by the results of other measures. For example a patient who reports poor control of blood pressure, LDL, and Hemoglobin A1C and who has heart failure with an ejection fraction of less than 40% should have an Advance Care Plan documented.

Conclusion: Lessons Learned in Achieving an Integrated Quality Management Approach, and Implications for the Future

The evolution of the PQRI program has great importance to health policy and reimbursement systems. It is a beginning, but it clearly has begun creating access to mechanisms of data capture for physician clinical data. The availability of data will determine what is measured and how it will be evaluated by payers and, eventually, by consumers. The active participation of the physician (or provider) is crucial in ensuring that this process is fair and accurate. We are entering a phase in which data will be used as a window into the physician's practice and will ultimately define both the physician's reputation and payment.

The key to physician engagement and review of data is involvement in the data entry and data validation process. This can only be achieved if baseline patient data is already populated in a registry, which is why claims-based registries (such as Iris) ultimately work better than those requiring direct input. A claims-based registry is a good foundation for physicians to be able to perform the actual coding, using a combination of paper prompts, direct entry, or alerts as his or her system and practice dictates.

Registry reporting will require support to the physician and the practices. Physicians will need to be notified when coding is incomplete or missing, and have the opportunity to correct prior miscoding. Also, feedback to the physician through registry reports will engage the physician so that there are possibilities for improvement.

The case examples of ICLOPS' Iris show that data collection, patient registries, patient surveys and communication, feedback mechanisms, and physician reporting can be integrated into a comprehensive quality process. A registry can be the basis for fairer and more accurate physician quality measurement, as well as chronic disease and preventive care management. In order to achieve such a comprehensive system, however, the registry must have functionalities that have never been deployed in the past. These include:

- A process of validating and modifying registry data coming from claims history. Since claims data is also used to populate payers' independent assessments of quality, the use of a registry rather than raw claims for measurement provides a

protection for physicians from misattributed patients as well as prior coding problems.

- Feedback and alerts to physicians on patients who have not met process measures, patient adherence factors, and clinical results in the practice. Feedback will engage the physician in the quality process requirements. As ICLOPS has seen with its physician clients who review their data, there can be immediate changes in behavior resulting from the personal review of data -- and the comprehension that the data is available for external review.
- Data feeds to registries from a variety of different systems, including EMRs. While Category II and registry codes are an effective method of quality data capture, eventually EMRs should be able to transmit data directly into the registries without the additional need of supplemental reporting. Both registries and EMRs have distinct and important functions in patient quality. EMRs can work effectively to collect individual patient clinical data obtained during an encounter as well as laboratory data. The creation and maintenance of multiple patient registries is possible with a registry-generating multi-dimensional database, with uniform rules for registry generation and an organization focused on this process. At this time, EMR data collection is not standardized, and EMR implementation by practices is certainly not. This will prevent EMRs from being an immediate source of uniform quality data. Registries are a solution to this by drawing information from EMRs but having an independent function of converting data from multiple sources, as well as handling the management of specific-payer registry criteria and updates. Registries can maximize their potential by being able to access some information that is only available from EMRs and payers, such as prescription information.
- A single quality management process that accommodates multiple payers and physician measurement needs. ICLOPS' experience makes it clear that physicians are unable to increase their workload or comply with variable requirements, and that a registry such as Iris can fuel many quality project purposes. For quality management to work, a single registry must be able to list patients according to multiple payer and condition sub-registries and be a universally available conduit of physician and patient quality input.
- Incorporation of patient feedback and reflection of patient-directed quality measures into registries. Patient satisfaction levels and patient actions to follow

up with physicians and agree to diagnostic tests and treatments are appropriate for inclusion in quality metrics. Patient feedback is a necessary input into the quality measurement process, especially if analyzed with clinical data. Physician quality cannot be measured without also examining patient-controlled actions, such as keeping appointments. Likewise, patient information on barriers to their treatment adherence can be a valuable tool for management of populations with specific conditions. Iris reports a patient Visit Adherence Index for some primary care physicians and for others, analyzes patient survey information in relation to other quality measures.

With a fully integrated quality management process, physicians will more readily participate and the intended effect on patient care will begin to occur. ICLOPS' experience with its patient registry Iris shows that it is feasible to engineer a registry that will fulfill many different goals – to validate data, to correctly attribute patients to physicians, to report quality codes, to give physician feedback, and to provide a mechanism for patient input. The combination of a flexible registry and physician-friendly processes can bring real quality into reality.