

## *Chapter 2*

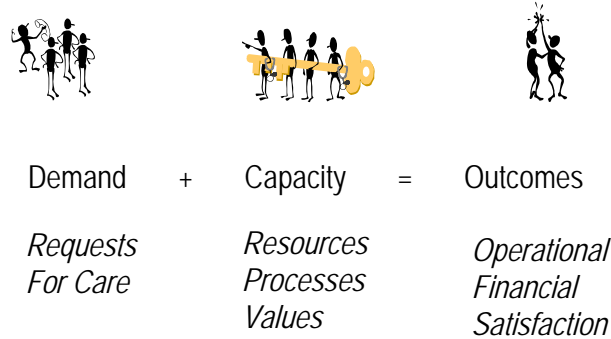
# Improving the Invisible

On any given day, office staff can be observed busily completing various work processes, but it's not always clear exactly where those processes begin and end. In fact, much of the work isn't tangible or easy to see. To some extent, improving care is like improving the invisible.

The Healthcare Matrix<sup>©</sup>, Access Pathways<sup>©</sup>, and Healthcare Equation<sup>©</sup> are designed to help make the intangible easier to see. The Healthcare Matrix illustrates the interface between key phases and resources involved in an episode of care. Access Pathways and process maps delineate steps in high-volume activities. The tools can be used to assess problems as well as compare improvement options. The simplicity of the tools is intentional to make improvement concepts clear for a variety of users—from managers and providers to medical assistants and even patients. The tools can also provide a common reference point for improvement work.

Simply stated, healthcare is what happens when provider capacity meets the demand for care to produce outcomes or results. The Healthcare Equation provides a simple visual summary of an organization's interactions with patients and the results. (See Figure 2.1.)

**Figure 2.1 The Healthcare Equation®**

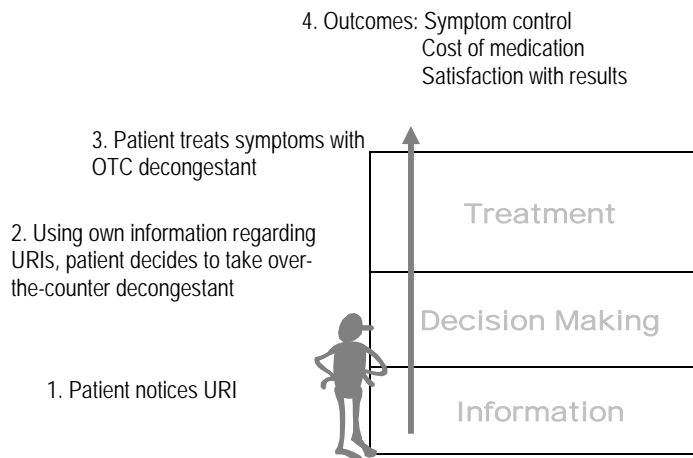


*Demand* is total patient requests for care. *Capacity* is the sum total of a group’s resources, processes, and values. *Outcomes* are the operational (including clinical), satisfaction, and financial results when capacity and demand interact to produce an episode of care. Satisfaction outcomes include patient and staff satisfaction, while financial outcomes include optimizing costs as well as revenue and income.

A group’s resources include its people, buildings, and equipment (things that can be seen) as well as intangibles like relationships and time. Values can be defined as what matters most to an organization—the core beliefs that drive activities and how resources are used. Processes are a group’s major activities, from care delivery to making appointments.

Any episode of care, from self-care to open-heart surgery can be divided into three phases: information, decision making, and treatment or action. For example, a patient may notice symptoms of an upper respiratory infection (URI) and then use his or her information regarding the symptoms to make a decision to self-treat with an over-the-counter (OTC) decongestant. Outcomes might include control of symptoms, the cost of the medication, and patient satisfaction with these results. (See Figure 2.2.)

**Figure 2.2 Phases of Care**



An episode of care may involve up to three human resources: patients, nonphysician staff, and physicians. (See also Figure 2.3.) The Healthcare Matrix in Figure 2.4 illustrates both the human resources and processes involved in an episode of care. It provides a framework for the interplay between clinical office activities and resources. Office processes can be mapped onto the matrix to better see opportunities for improving information, decision making, and treatment as they relate to resources.

**Figure 2.3 Human Resources**

Patients	Non physician Staff	Physicians
----------	---------------------------	------------

What would be your ideal model of patient, staff, and physician interactions? Would all three groups be functioning at the full limit of their capabilities? How would your facility’s budget be spent differently in the next year? How does this compare with present allocations? Is significant funding going for new treatment technologies while long waiting periods plague access to that treatment? Would enabled patients be better informed about self-care management and how to best utilize your services? Should the

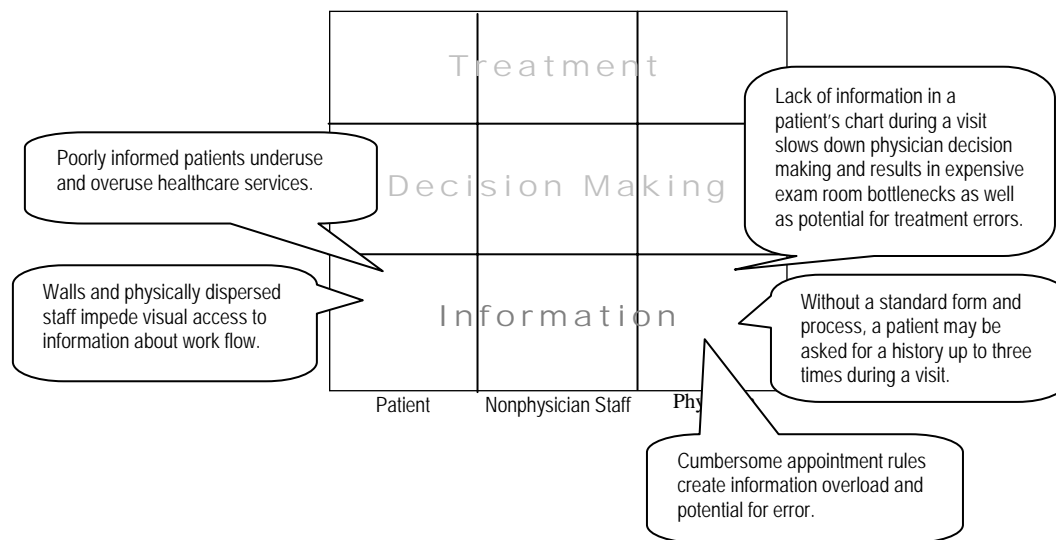
**Figure 2.4 Healthcare Matrix®**

	Treatment	
	Decision Making	
	Information	
Patients	Nonphysician Staff	Physicians

traditional command-and-control model prevail where physicians must take time to authorize many decisions, from frequent appointment approvals to each prescription refill? Could patient waiting times and physician interruptions be reduced if more decisions were delegated or standardized?

Information gathering is the first step in an episode of care. Access to the right information in the right place at the right time enables effective decision making. Conversely, decision making is hampered when information is lacking or late. (See Figure 2.5.) While robust electronic medical record systems provide immediate access to clinical information, only about 20% of hospitals and 5% of physicians use electronic medical records (Medscape, 2004). (See also <http://www.aafp.org/x3697.xml> for a discussion of electronic medical record systems.)

**Figure 2.5 Common Information Flow Issues**

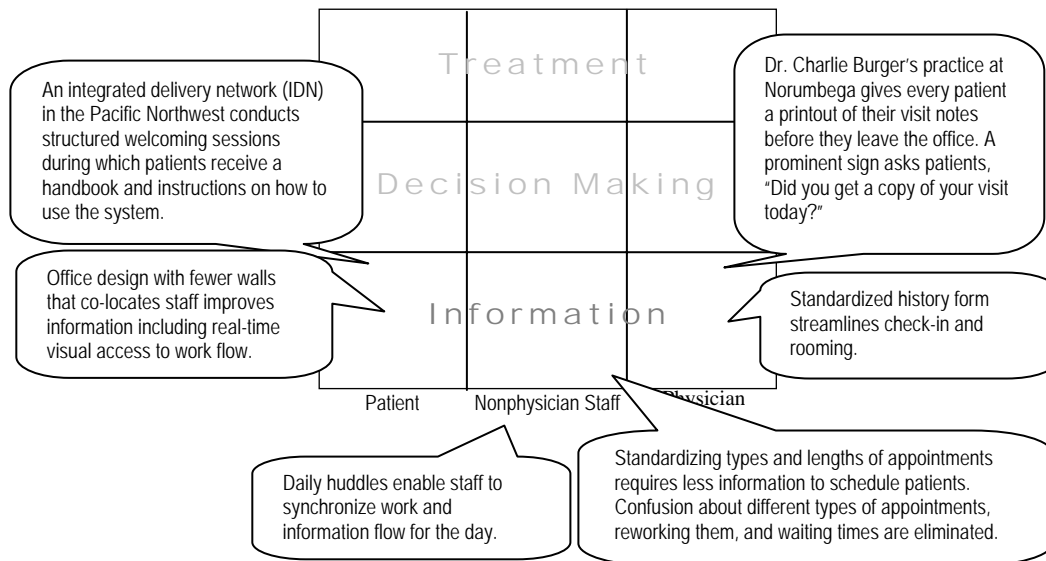


Process flow from information to decision making and treatment or action can be optimized when decisions are decentralized. Interruptions are reduced and physicians are freed up from tasks that could be done by other staff. Automation also helps. Use of personal digital assistants and computers to automate memory-based decisions that are prone to error (such as selecting prescription medication dosages) ensures accurate prescribing. (See Figure 2.6.)

Staff at Denver's Clinica Campesina has found that simply color coding or "branding" charts for each team helps to avoid delays in information flow. For example, if a yellow team's chart is in the blue team's section, staff can easily see that it belongs elsewhere. Business cards also reinforce a team's color, reducing confusion for patients upon checking in.

Well-informed patients use provider resources more efficiently and are less likely to overuse care. Books such as *Take Care of Yourself* (Vickery, D., & Fries, J., 1994) and *The Healthwise Handbook* (Kemper, D.W., McIntosh, K.E., & Roberts, R.M., 1993) promote patient participation in care. In addition, practice-specific patient handbooks can help patients learn how to access and use a group's services. Handbooks also include self

**Figure 2.6 Improving Information Flow**

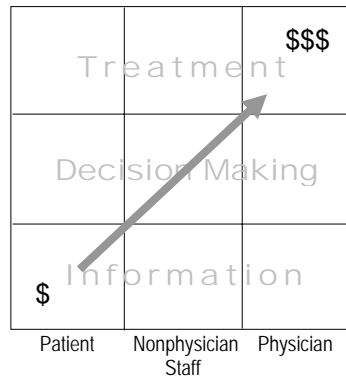


care information, as well as pages for patient questions, and notes from office visits. An integrated delivery network (IDN) in the Pacific Northwest reduced calls for basic information by conducting welcoming sessions and distributing handbooks to new patients to explain how to use its system. The results? Patients are delighted and the staff appreciates the chance to build relationships in a more relaxed environment.

Some sites actively encourage patients to seek information. Dr. Charlie Burger’s practice at Norumbega in Maine shares its medical record notes with patients at the end of each encounter. A prominent sign asks patients as they leave the office, “Did you get a copy of your visit today?” (See also case study #3.) In one study, patients who listed at least three issues while in the waiting room asked more questions, reported less anxiety, had greater feelings of control, and were more satisfied with the visit and the information received than patients who did not write a list (Thompson, S.C., & Nanni, C., 1990). Ultimately, making sure that patients have the right information at the right time and in the right place is a lot cheaper than costly treatments necessitated by poorly informed patients who use healthcare resources inappropriately. (See Figure 2.7.)

Engaging patients in decision making regarding treatment options and encouraging self-management can impact outcomes. Hibbard found that patients who shared decision making and chronic disease self-care have improved functioning and reduced pain. Costs were also reduced (Hibbard, J.H., 2003, January). The chronic care model developed by Dr. Ed Wagner actively builds patient self-care skills. Leaders from several case study sites included herein describe how important the model has been in their own improvement efforts. In addition, Leveille et al. found that the chronic care model

**Figure 2.7 Least Expensive & Most Expensive Phases of Care**



reduced hospitalizations by 38% for frail older adults and led to significantly higher levels of physical activity and less decline in function (Leveille, S.G., Wagner, E.H., Davis, C., Grothaus, L., Wallace, J., LoGerfo, M., et al., 1998, October).

*Each patient carries his own doctor inside him. We are at our best when the doctor who resides within each patient has the chance to go to work.*  
 —Albert Schweitzer, M.D.

Appropriately used, standardized treatment protocols have also been effective. At Park Nicollet Clinic in Minnesota, physicians’ schedules were clogged with minor illnesses like uncomplicated urinary tract infections (UTIs) in women. Instituting phone treatment protocols, the staff at Park Nicollet alleviated the hassle of an office visit for these patients and expanded the nurses’ role. In addition, physician time was freed up and costs per episode dropped from \$139 to \$33.

Physical space also affects information flow. Removing walls and bringing dispersed staff closer together enables access to real-time visual information about work flow. It’s also consistent with the lean production principle of locating all the steps in linked processes or “value-streams”—from check-in, to rooming, and physician time with patients—closer to one another.

***Itemize Steps to See the Whole Process***

High-volume activities like refilling prescriptions, making referrals, messaging, and scheduling office visits can be mapped out to better “see” the total process. First, identify each step on index cards or small pieces of paper. Then post them in sequence on a large sheet of paper, a wall, or the Healthcare Matrix. Start with the most common steps in a process instead of including all additional steps that might be required. Be sure to include hand-offs and authorizations. Next, indicate where the biggest delays occur. (See also Figure 2.8: Streamlining the Refill Process.)

The sequence of activities for refilling prescriptions, for example, might include:

1. Patient notices that he/she needs a refill.
2. Patient decides to call office to request a refill.
3. Patient calls office and refill request message is taken.
4. Request is given to nurse.
5. Nurse reviews request (delays of up to 3 hours can occur if nurse needs to clarify request with clerk who took message).
6. Nurse requests chart.
7. Nurse reviews chart.
8. Nurse sends chart with message to MD.
9. MD reviews chart.
10. MD authorizes refill (delays of up to 36 hours).
11. MD sends chart and message back to nurse.
12. Nurse reviews physician documentation and calls in refill (delays up to 12 hours).
13. Nurse calls patient to notify that refill has been called in to pharmacy.
14. Nurse documents refill in chart.

### ***Seeing Where to Improve***

After delineating the steps in a process such as refilling prescriptions, look for potential improvements to the process:

1. Realize that the greater the complexity and the number of steps, the greater the possibility for errors and delays. Ask if any steps can be consolidated or even eliminated. Avoid hand-offs to minimize learning curve delays for each new participant in a given process. In *The Perfect Practice*, Sherry Delio describes how adding more resources to a process actually increases the number of steps and reduces productivity:

*We have noted that when we add too many resources to a process, no more work is accomplished. Too much time is wasted on hand-offs and unnecessary communication. No one seems to know who is doing what.*

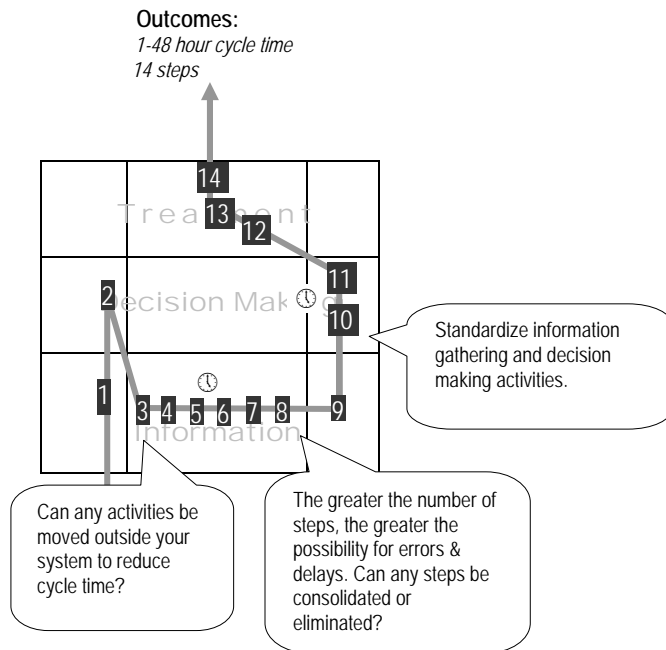
Delio goes on to describe the extra work created when too many people interact with patients to complete referrals:

*They never seemed to get completed in a timely manner and were generating a tremendous amount of extra work. Patients were calling in requesting updates on the status of their referral. Of course the only person who knew the answer was the referral person and if she was out, the whole process stopped. When we*

transitioned this task back to the back office, all the rework was eliminated and the referrals were done on the day of the visit. We reduced the waste by reducing the number of people interacting with the process and the patient (Delio, S., 1999).

2. Standardize information and decision-making activities for high-volume processes: e.g., messaging, history taking, appointments, and some refills. Standardization reduces slowdowns caused by repeated approval loops. In addition, standardizing appointment types and their duration significantly reduces confusion for staff while removing the need for authorization of at least some appointments. Standardizing message content saves time because clinical staff won't have to fill in information gaps.

**Figure 2.8 Streamlining The Refill Process**



3. Nearly 80% of the delays in a process are caused by 20% of the activities involved. Focus on where the longest delays occur. In the refill process, for example, they occurred while awaiting physician authorization. How could such delays be shortened? As the most costly human resource in delivering care, it's appropriate that physicians are the bottleneck or constraint. Shorten such delays by working around the physician constraint to improve the flow.
4. To smooth the flow from information to decision making, gather information once and make sure it waits for staff rather than staff having to wait for information. So-called loopbacks to retrieve missing information interrupt office visits and

slow down decision making. When such delays occur in the exam room, the resulting bottlenecks can grind other activities to a halt. Make sure charts have needed information before the office visit.

5. Can any activities be moved outside the system to reduce internal process cycle times, such as requesting that patients call their pharmacy for monthly refills as opposed to the physician's office?
6. Minimize the movement of people and information. Co-locating people doing related processes helps minimize the distance traveled to complete tasks. An inefficient rooming process that shuffles patients from the waiting room to a procedure room for vital signs and back to the waiting room before being called to an exam room is unlikely to be a hit with patients. Hotels don't inconvenience guests by requiring them to travel from one place to another for checking in, paying the bill, and obtaining a room key; why do healthcare providers? Efficient, patient-focused practices are bringing activities—from taking vital signs to performing lab work and discussing financial arrangements—to the patient, often right in the exam room. (This frequently includes increasing the average number of exam rooms per provider to three instead of two.)
7. Use the most appropriate resource to complete a given process. Are physicians routinely providing details about informed consent for immunizations? Are physicians' schedules clogged with appointments for minor illnesses like URIs? One integrated delivery network had physicians, RNs, and medical assistants routinely providing the same structured 10-minute prevention counseling session. At some sites physicians did the counseling while at others, medical assistants were doing the same work. Up to 45 minutes of provider time was freed daily when the activity was turned over to medical assistants who have completed a training program in prevention counseling. Physicians occasionally conduct the sessions, but now medical assistants conduct most of them. The result? Medical assistants and physicians now function at a level more appropriate to their skills.

These strategies reflect the lean-thinking approach of eliminating waste during each step of a process, with the goal of avoiding work stoppages and backflows.

Several sites with whom the author has worked have streamlined the prescription refill process for selected medications. Improvements include reducing the number of steps in the process and simplified decision making; for example, nurses are authorized to complete refills for some medications based on standardized protocols. The improvement has simplified refills for nearly 40% of requests. Four steps were removed from the process as well as significant delays:

**Before**

1. Patient notices that he/she needs refill
2. Patient decides to call to request a refill
3. Patient calls office and refill request message is taken

**After**

1. Patient notices that he/she needs refill
2. Patient decides to call to request a refill
3. Patient calls pharmacy and refill request message is taken

*Improvements: Step 3 has been moved outside the provider office “system.” This change also reduces the number of times the refill request must be recorded from two (at the office and at the pharmacy) to one (at the pharmacy).*

4. Request is given to nurse
5. Nurse reviews request (delays of up to 3 hours if nurse needs to clarify request with clerk who took message)
6. Nurse requests chart
7. Nurse reviews chart
8. Nurse sends chart with message to MD

4. Pharmacy faxes request to nurse
5. Nurse reviews request from pharmacy
6. Nurse requests chart
7. Nurse reviews chart
8. If medication is among those in protocols, refill authorization is noted on fax

*Improvements: “before” steps 8 through 11 have been eliminated; so are delays related to physician authorization. Standardization of refill process reduces potential for error. Message taking has also been standardized, reducing delays. In addition, the number of handoffs and movement of information back and forth have been reduced.*

9. MD reviews chart
10. MD authorizes refill (delays of up to 36 hours)
11. MD returns chart and request to nurse
12. Nurse reviews physician documentation and calls in refill
13. Nurse notifies patient that refill has been called in to pharmacy
14. Nurse documents refill in chart

9. Authorized refill is faxed back to pharmacy
10. Fax with refill notation is entered directly into chart

**Improving Office Visit Flow**

Patient office visits are a major activity for ambulatory care providers. They require significant resources and are often the major source of revenues for a practice.

Key steps, from beginning to end, for an office visit might include:

1. Patient notices need to seek care
2. Patient decides to call for an appointment
3. Patient calls to make an appointment
4. Arrival and check-in
5. Vital signs
6. History
7. Physical assessment
8. Make diagnosis
9. Treatment or procedure
10. Documentation
11. Check-out
12. Lab/X-ray
13. Pharmacy

The Access Pathway<sup>®</sup> provides a visual map of patient flow as well as activities or service points that occur during an office visit. Access pathways can be used to explore alternative ways to access care, including mid-level visits, group visits, and self-care. With access pathways, improvement teams can work on specific flow issues as well as desired outcomes. (See Figure 2.9.)

After mapping out the steps in an office visit, consider where the biggest delays and bottlenecks occur at your site. Following are potential improvements that relate to specific activities or service points during an office visit.

Steps	Optimizing Flow
1. <i>Patient notices need to seek care</i>	
2. <i>Patient decides to call for an appointment</i>	a. Are patients savvy about deciding when they need a visit versus self-care, thereby reducing requests for unnecessary visits?
3. <i>Patient calls to make an appointment</i>	a. Does provider time in the office match predictable ebb and flow of patient demand during the week so available appointments match demand?

- b. Are there numerous appointment types and lengths? Can appointment types and lengths be simplified?
  - c. Are scripts used to simplify the appointment process for staff? (See also the Appendix.) Scripts also ensure that a consistent message is communicated to patients.
- 4. *Arrival & check-in*
  - a. Can some steps (such as pre-registration) be completed on the phone before the visit?
  - b. Are front and back office staff co-located or working in proximity to reduce the number of steps during a visit?
- 5. *Vital signs*
  - a. Are blood pressure cuffs and scales available in exam room to reduce bottlenecks during rooming?
  - b. Are standardized protocols used to define rooming activities for well-baby exams, diabetic checks, physicals, and so on?
- 6. *History*
  - a. Is needed information, like the patient history, taken once and consistently or multiple times and in a variety of ways?
- 7. *Physical assessment*
  - a. Does *appointment time* mean when the patient arrives or when the provider walks into the exam room? Synchronize *appointment time* to mean the same time for everyone.
  - b. Do other activities compete with patient visit time, resulting in frequent interruptions? Exam room delays create expensive bottlenecks.
- 8. *Make diagnosis*
  - a. Is the provider able to access enough of the right information to make an appropriate diagnosis in a timely way?
- 9. *Treatment or procedure*
  - a. Is access to current prescription drug information at the point of care automated (e.g., via a PDA)?
  - b. Are there alternative venues and staff available for in-depth patient education about asthma, hypertension, and diabetes (e.g., nurse visits)?
  - c. Is patient input encouraged regarding treatment options?
  - d. Can providers quickly and easily indicate that assistance is needed to support staff?
- 10. *Documentation*
  - a. Does the patient receive a thorough explanation of findings?

11. Check-out

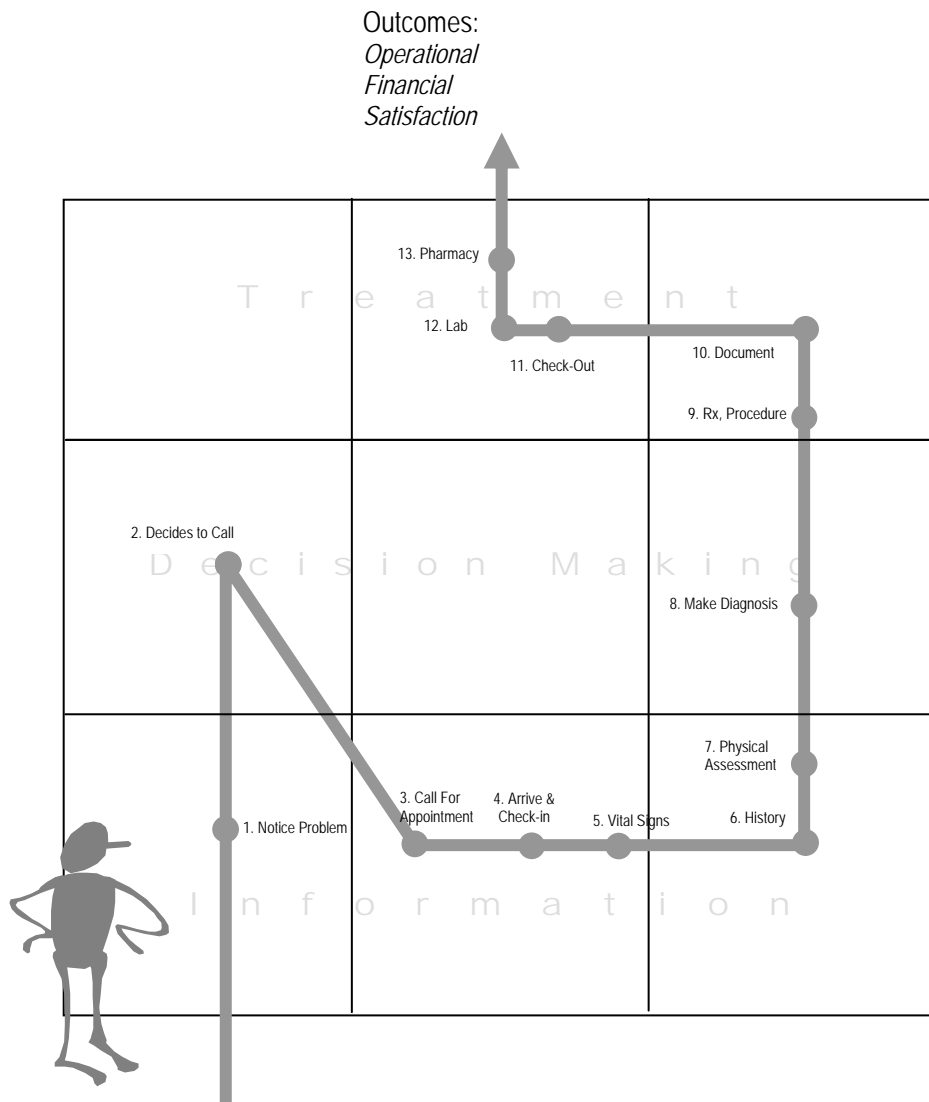
a. Can check-out be done in the exam room?

12. Lab/X-ray

a. Is patient travel to ancillary services minimized?

13. Pharmacy

**Figure 2.9 Office Visit Access Pathway**



Additional issues that impact patient flow include:

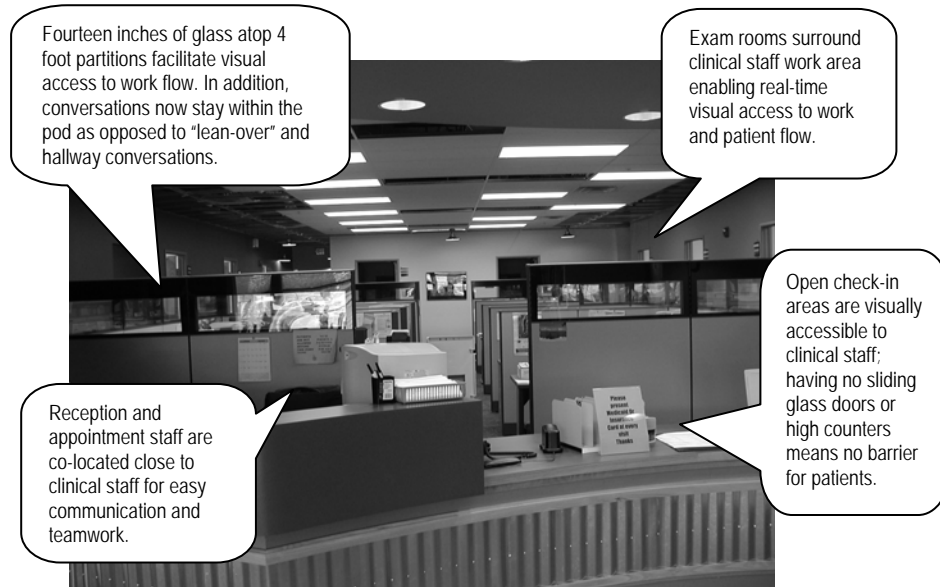
1. Whether staff works as a team and cross-functions as needed. Having staff cross-function maintains patient flow and reduces waiting time that occurs when activities, such as taking vital signs and making appointments, are limited to certain individuals within a group.
2. Whether work is pushed into the future as opposed to doing it now. Inevitably, returning to complete charting or making a referral requires a brief review or learning curve as a staff member recalls the “how, what, and why” of a given task. When postponed work is handed off to another person, completion is further delayed by a second learning curve. Handing off also increases the potential for error. From referrals to appointments, *doing it now* saves rework and delays.
3. Whether the number of exam rooms is sufficient to accommodate demand. Some sites are moving to three instead of two rooms per provider to prevent bottlenecks when more services are brought to the patient in the exam room.
4. Whether office layout enables visual access to both work flow and patient flow. Clinica Campesina has redesigned the physical space at a number of its Denver-area sites to improve patient flow. A notable change has been arranging exam rooms around each team’s, or pod’s, “bullpens” where providers and clinical support staff have their desks. Check-in staff for each team is co-located immediately in front of the bullpens, bringing staff and many steps in the care process close together. This enables real-time visual access to patient flow. (See Figure 2.10.)

Even simple measures can streamline patient flow. After trying walkie-talkies and cell phones to facilitate office visit flow with mixed success, we’ve found that five color-coded, stacked plastic flags work best. The flags are moved to the left, right, or perpendicular to the wall outside an exam room. A flag’s direction indicates that a patient is waiting, a provider is in the room, or a certain type of assistance is needed—from the medical assistant (MA), ancillary, or check-out personnel.

5. Whether staff meets or “huddles” each day to review schedule and plan visits. Formally structured huddles with the entire care team can streamline daily planning and coordination of care. Typically, huddles are held for 5 to 10 minutes at the beginning of the day or after lunch. Staff at some sites stand for huddles and find it helpful to hold them in the mid-afternoon to review the next day’s schedule. A key benefit of huddles is that planning work for the day helps minimize the common, costly delays that occur when needed information lags patient flow during office visits.

**Figure 2.10 Exam Rooms Surround Staff to Improve Work flow**

*Source: Clinica Campesina, Denver, CO*



Activities for individual staff to ensure effective huddles include:

- |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medical Assistants | <ol style="list-style-type: none"> <li>1. Consider possible bottlenecks that may arise in the schedule (e.g., two high-needs patients scheduled back-to-back)</li> <li>2. Cancel scheduled appointments for OB patients who have delivered as well as patients who have been hospitalized</li> <li>3. Ensure that patients are being scheduled for post-partum and newborn care visits</li> <li>4. Set up procedures and request outstanding labs and reports</li> <li>5. Make sure needed forms are in charts (e.g., OB visit forms, immunizations)</li> </ol> |
| Nurse              | <ol style="list-style-type: none"> <li>1. Consider phone contacts or rescheduling appointments if providers have too many patients</li> <li>2. Look for potential patients who could have nurse visits</li> <li>3. Review provider call situation; check to see if any staff out sick</li> <li>4. Identify potential slots for double booking if needed</li> </ol>                                                                                                                                                                                              |

- |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Front Desk | <ol style="list-style-type: none"> <li>1. Alert staff to chronic no-shows, chronic late or disruptive patients</li> <li>2. Do chart prep: Ensure enough blank progress notes, name of patient on all sheets; have new patient sign request for information if possible</li> <li>3. If available slots, call patients to come in for appointments</li> </ol>                                                                                                                                                                                                                           |
| Provider   | <ol style="list-style-type: none"> <li>1. Review list of scheduled patients. Help nurse and MAs plan flow and anticipate patient needs</li> <li>2. Request needed lab, procedure, or ED reports</li> <li>3. Let staff know of any potential for double booking</li> <li>4. Check for patients that always take a lot of time (patients with lots of co-morbidities, complaints, elderly)</li> <li>5. Check for opportunities to create capacity-scheduled appointments that could be handled by phone</li> <li>6. Look for opportunities to trade patients to own provider</li> </ol> |

*Huddle activities above adapted from those of Clinical Campesina.*

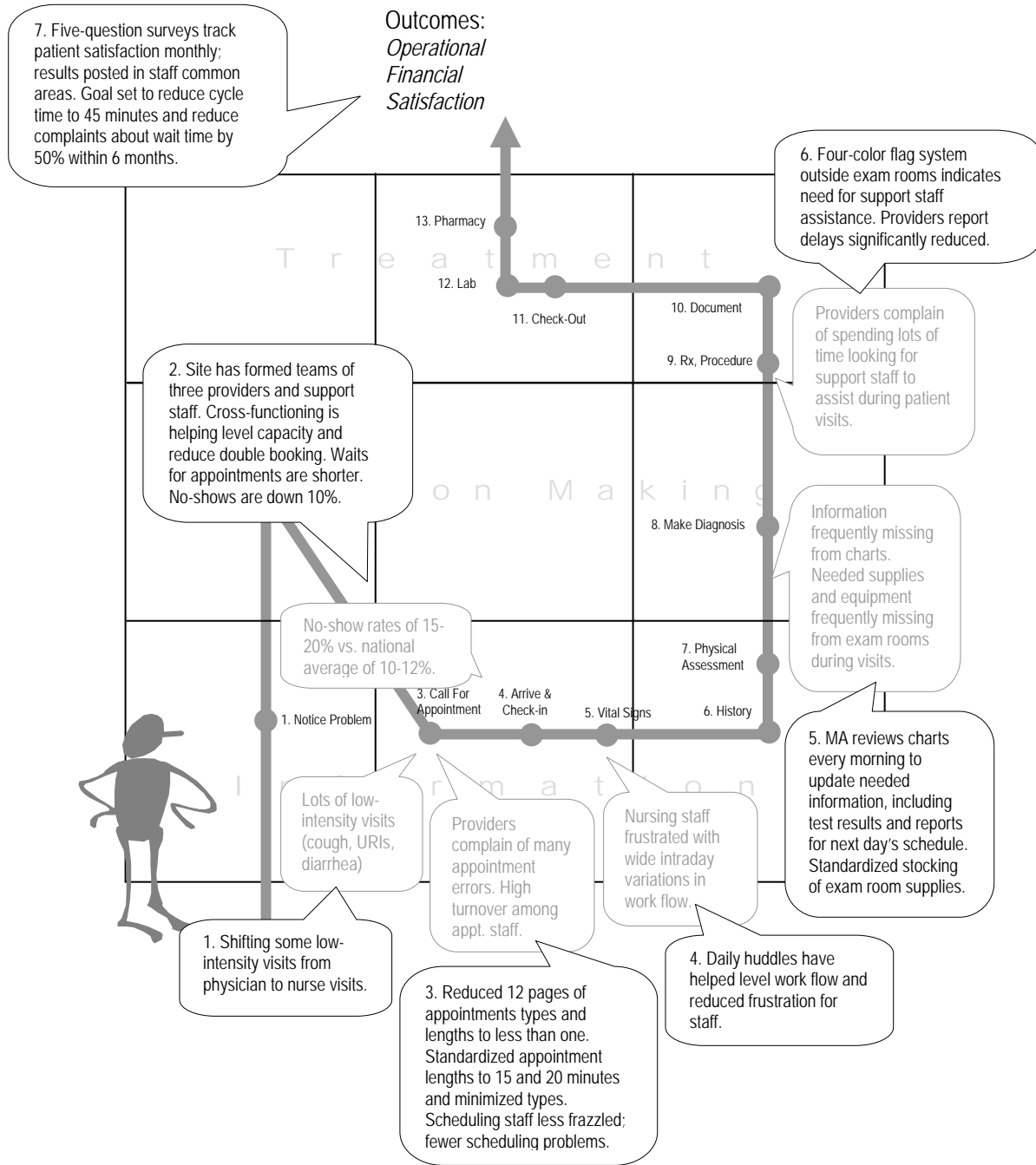
If you asked the physicians, medical assistants, clerical, and nursing staff to identify what “needs fixing” regarding office visit flow at your site, what would they say?

At one site with whom the author has worked, no-show rates were between 15% to 20% and patients were waiting up to two-months for an appointment. Nurses were frustrated with wide variations in daily work flow. Physicians complained about lots of appointment errors. Turnover among appointment staff was high. Information was often missing from charts during office visits, and needed supplies were only sporadically available in exam rooms. Providers also spent an inordinate amount of time tracking down support staff when they needed assistance during an office visit. Many visits were for minor illnesses. In addition, 44% of patients were dissatisfied with their time spent waiting during visits. The average cycle time was 72 minutes.

Given these issues what would you advise if asked for assistance by this site’s leadership? (See Figure 2.11.) Where are the most expensive delays occurring? Where would you start with improvement? Four months later the site is off to a very good start. An improvement team has been formed that meets regularly and reports to the group’s executive director.

Appointment types and lengths have been streamlined. Teams of three FTE providers and support staff have formed. As teamwork has grown, staff has also begun to cross-function, sharing responsibility for patients.

Figure 2.11 Improvement Efforts-Four Months Later



One physician has decided to shift some low-intensity visits to nurse visits. Simple patient feedback cards solicit answers to five questions every month and the results are posted in the staff dining area. The improvement group has set a goal of reducing the 72 minute cycle time to 45 minutes and cutting complaints about wait times by 50% in 6 months. Perhaps most important of all, leadership and staff have begun asking questions about the group's core values, including "What is the work of our practice?" "Who is our customer?" and "What are the needs of our patient population?"