ALBERTA AIM
ACCESS · IMPROVEMENT · MEASURES

AIM Measurement Overview

Updated March 2011

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As an organization or medical practice moves from its current state to the vision of a new state, it must change what it does and how it operates. This requires fundamental and profound changes in how the work is approached.

A set of high-leverage changes for access and office efficiency creates the foundation for improvement, and for our work in AIM. These changes have been used successfully with hundreds of other groups as they moved from traditional delivery systems to advanced access.

How do we know that making these changes actually results in an improvement?

To answer this critical question, clinics will need to collect a set of measures over a period of time. These measures help to demonstrate that the changes tested actually resulted in improved outcomes.

To assist teams with measurement and data collection, this measurement package consists of four parts:

- This document (*AIM Measurement Overview*), which provides an overview of the key measures for access, office efficiency and teamwork
- Excel files:
    - *Data Collection Toolkit Primary and Specialty* (contains electronic copies of collection sheets team members can modify and use to collect the data. Paper copies of these collection sheets are also included in the Participant Binder)
    - *AIMTracking* (file data will be recorded in ongoing)
    - *AIMAnalysis (* (generates graphs for analysis)

Copies of the above tools and resources can be downloaded from the Alberta AIM Website.

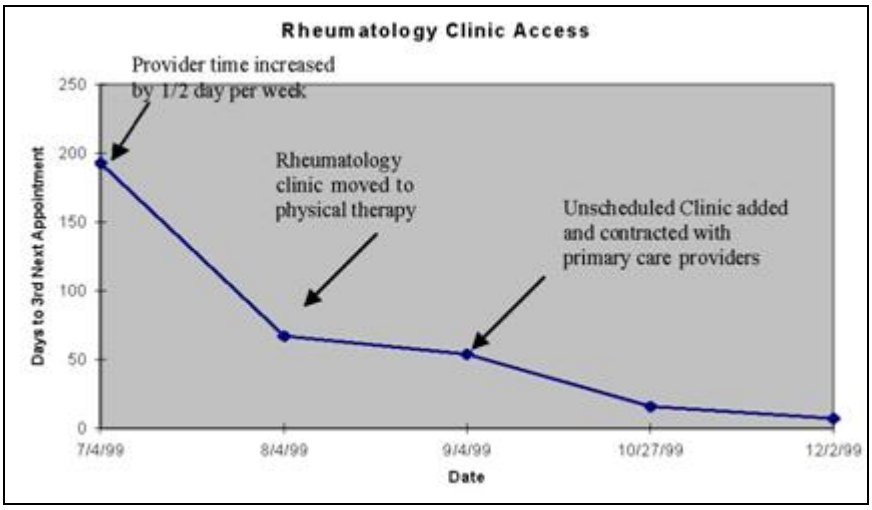
http://www.albertaaim.ca/measurment.html

We hope you find these to be useful tools and resources as you proceed with this challenging and rewarding work.

1 Measurement Principles

Measurement is an important way to help us understand the performance of the current system, identify the areas on which to focus attention, set goals for improvement, and assess the results of changes made.

Annotated run charts, such as the Rheumatology Clinic Access example below, are an excellent tool to provide a visual analysis of the changes made. This graph shows the performance of the system over time and identifies key events and any other circumstances that could affect performance.



Measurement should be used to speed improvement, not to slow it. A team should employ just enough measurement to know whether the changes they are making are leading to improvement, but not so much to become buried in the measurement process itself. Consider the following ideas to make measurement simple and effective.

1.1 Plot Data Over Time

Improvement requires change and change occurs over time. Much of the information about a system and how to improve it can be obtained by plotting data (access delays, cycle time, etc.) over time, and observing trends and other patterns. An annotated run chart (such as the one above) works well to display data and trends.

1.2 Focus on the Measures Directly Related to Your Aim

If the aim is to reduce the length of time a patient has to wait to see his/her provider of choice, collect data on delay and plot components such as time to third next available appointment on a run chart. This will allow you to see the effects of your improvement efforts.

1.3 Use Sampling

Amongst the AIM measures sampling is a technique used to collect cycle time data.

Sampling is a simple, efficient way to understand how a system is performing without having to engage in an overwhelming amount of cycle time data collection and analysis. When large system changes are desired, the variety of conditions included in the sample, rather than sample size, is the primary concern. That is, the sample should be representative of variability within the system. Sampling is especially important if an organization does not have an electronic data collection system. To save resources, rather than obtaining cycle time data for every patient, try obtaining data for every 20th patient or for patients arriving at set times over the course of the day (*e.g.* 9:00 a.m., 11:00 a.m., 1:00 p.m., and 3:00 p.m.).

1.4 Use Rapid Improvement Processes

Teams are encouraged to use rapid cycle improvements or frequent small tests of change (PDSA cycles) to improve existing and/or introduce new processes or systems.

1.5 Integrate Measurement into the Daily Routine

Useful data is often easy to obtain without relying on an electronic information system. The *Data Collection Toolkit Primary and Specialty* file contains collection sheets that can be printed, customized and used for manual data collection.

1.6 Create Graphs

Graphs are excellent visual display of measures over time, and are used to convey information on a team's progress toward a goal. The aim of any visual display is to present the greatest amount of information in the smallest space using the least amount of ink.

Once data is recorded in the *AIMTracking* file, the *AIMAnalysis* file can be used to automatically generate graphs of your improvement data.

2 What to Measure

The following key measures will help teams to understand their current situation and measure their improvement progress.

(NOTE: Some of the advanced measures described in this document are not included in the AIM Tracking Excel file. However, if teams choose to, they can develop their own methods for tracking them.)

Access Measures

- Delay
  - Third next available appointment
  - Future open capacity
  - Percent of appointments made today on today's schedule
- Demand
  - Demand
  - Continuity
- Panel size/Caseload size
- Supply
  - Appointments per session
  - Provider full time equivalents (FTEs)
- Activity
  - Activity (Supply used)
- No-shows

Efficiency Measures

- Cycle time
- System mapping

Teams and Team Work Measures

- Team functioning assessments

Outcome Measures

- Patient satisfaction
- Staff satisfaction
- Provider satisfaction
- Health outcomes
- Financial outcomes

3 Access Measures

The focus of the Alberta AIM Initiative is to reduce the delay a patient experiences when attempting to book an appointment with his/her provider.

The delay, or wait time, for an appointment reflects the gap or time lapse between when the demand for the appointment is declared, and when the resource or the supply by the provider is available. We commonly refer to this as backlog.

In order to understand the dynamics of the appointment system, we need to measure delay, demand for appointments, supply of appointments and activity.

3.1 Delay

Delay measures track the amount of backlog and the amount of future available capacity.

- Third next available appointment is used to determine the amount of backlog that exists
- Future open capacity shows the number of open appointment slots for the future
- Percent of appointments made today on today's schedule indicates the degree to which today's demand is being seen today

Together, these measures indicate a team's progress in creating future capacity and reducing the backlog.

3.1.1 Third Next Available Appointment

The most basic measure of delay is the **number of calendar days to the third next available appointment (TNA)**. The third next available appointment is used — rather than the first or

second —because it is a better reflection of system availability, since the first or second next available appointment may be available due to a cancellation or some other event (*i.e.* uncontrollable variability). It is important that this measure be an indicator of when an appointment is available by easy, barrier-free means, not by begging the provider or nurse for an earlier appointment. It is simply the third next available appointment offered by the scheduling system as the scheduling system is set up today. As the team tests strategies and simplifies the scheduling system, the third next available appointment will reflect these changes.

Third next available appointment can be tracked as follows:

- **For Primary Care** - by “Short” or “Long” appointment. There are no set definitions for each of these appointment types – it is up to each clinic to determine what a short appointment is and what a long appointment is.
- **For Specialty Care** – by “New” or “Return” appointment. It is important to distinguish between patients that are seeing the specialist for the first time, and those who are returning because of an ongoing need.

3.1.1.1 Measuring Third Next Available Appointment (TNA)

To find the third next available appointment for a specific appointment type, count the number of calendar days from a selected data collection day to the day when the third next appointment of the same type is available.

(Note: This includes Saturdays and Sundays even if the clinic is not open on weekends.) Collect this data on the same day at the same time each week for each provider.

Example – Collecting TNA for a "Short" Appointment

- Dr. Jane's schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday
Time	5-Nov-07	6-Nov-07	7-Nov-07	8-Nov-07	9-Nov-07	10-Nov-07	11-Nov-07	12-Nov-07
0900-0910	BP check	Shrt of breath	BP check	BP check	BP check	closed	closed	BP check
0910-0920	Prenatal	Remove Wart	Prenatal	Prenatal	**Not booked**			Prenatal
0920-0930		Asthma			**Meeting**			
0930-0940	Well baby	**Not booked**	Well baby	**Not booked**	**Flu**			**Not booked**
0940-0950	Sore toe	#2 Prenatal	Sore toe	Sore toe	Sore toe			Sore toe
0950-1000	Nursing home	Well baby	Nursing home	Nursing home	Nursing home			Physical
1000-1010	discussion	Ear syringe	discussion	discussion	discussion			
1010-1020	Dressing	Dressing	Dressing	Dressing	Dressing			Dressing
1020-1030	Sore eye	Sore eye	Sore eye	Sore eye	Sore eye			Sore toe
1030-1040	Flu	Flu	Flu	Flu	Flu			Flu
1040-1050	Diabetes	Diabetes	Diabetes	Diabetes	Sore Knee			Diabetes
1050-1100	Back pain	Back pain	Back pain	Back pain	Back pain			Back pain

- A "Short" appointment for Dr. Jane is defined as a 10 minute slot

- Jerry does the count on **Tuesday at 10 a.m.:**

  1st next available appointment: Thursday at 9:30 am

  2nd next available appointment: Friday at 9:10 am

  3rd next available appointment: Monday at 9:30 am

- Third next available appointment = 12 (Nov 12th) minus 6 (Nov 6th count day) = **6 days**

- Jerry would record "**6**" days for a short appointment for Dr. Jane for the week of November 5th

Week beginning:	Delay Type	Dr. Jane	Provider 2
05-Nov-2007	Short	6	
	Long		
12-Nov-2007	Short		
	Long		

- Data can be recorded on the TNA toolkit collection sheet for later entry into the *AIMTracking* file or directly into the *AIMTracking* file

Tips

- It is helpful to collect the measures even when the clinic/program is experiencing unusual circumstances. Having the data for every week, no matter what the circumstances, will help

show the results of events such as holidays and also the results of improvement such as contingency plans during peak periods.

- It is helpful to have an alternate person for taking measurements so that the data can be collected consistently, even when the usual data collection person is not available

3.1.2 Future Open Capacity

NOTE: a tab for collection of this measure is not included in the *AIMTracking* file.

This measure is a determination of the number of **open** appointment slots, expressed as a percent of the total number of appointment slots, within a specified period. The usual period is four to five weeks. This data is especially important when the third next available appointment data approaches "today." It is therefore a more sensitive indicator of access.

3.1.2.1 Measuring Future Open Capacity

- Determine how many total (open and booked) appointment slots a provider has within the specified amount of time (A)
- Count how many of those are open (B)
- Divide the number of open slots (B) by the total number of slots (A) to obtain the percent of future open availability

Example

If a provider has 440 appointment slots (open and booked) in a four-week time frame, and 220 of them are not filled, then future open capacity is 50%. It may mean, however, that tomorrow is only 10% open, and twenty-five days from now is 90% open.

3.1.3 Percent of Appointments Made Today on Today's Schedule

NOTE: a tab for collection of this measure is not included in the *AIMTracking* file.

This measure indicates how much of today's work is actually being done today, and is an extremely important parameter to track. Ideally, the scheduling system can be used to report on this measure. Otherwise, staff must perform this task manually.

3.1.3.1 Measuring Percent of Appointments Made Today on Today's Schedule

- Determine how many appointments were made today for each provider no matter where/when they were scheduled (A)
- Divide today's appointments booked today (B) by the total number of appointments made today (A)

The answer is the percent of appointments made today on today's schedule

This data can be graphed on a run chart similar to the third next available appointment run chart.

Example

If a there were a total of 30 appointments made today for Dr. Red (scheduled for today or another day in the future), and 10 were booked in today's schedule, the percent of appointments made today on today's schedule is 10 divided by 30, or 33%.

3.2 Demand

When compared with supply of appointments, demand for appointments can help determine whether a provider has more work than he/she can reasonably manage, or whether he/she has excess capacity. It also helps teams decide which change strategies to test first. For example, if demand is clearly greater than supply, providers might use strategies to gain capacity and reduce demand before attempting the difficult work of backlog reduction.

3.2.1 Demand

Demand is defined as the **number of appointments booked today irrespective of the day of the appointment.** These appointments are booked **"on"** today but not necessarily booked **"for"** today. Demand varies from to day to day, and seasonally. It is extremely important to track this data over time so that trends and variation can be determined. This allows a practice to develop plans to meet demand.

Primary Care

In primary care, it is useful to capture demand in two categories – internal and external:

- External demand is generated by patients randomly requesting an appointment, whether the appointment is scheduled for today or in the future. Sources of external demand include phone calls, walk-ins, faxes and emails.

- Internal demand is generated by the provider in the form of follow-up **appointments that are booked by the patient before he/she leaves the clinic.** All other demand is counted as external.

Specialty Care

In specialty practices/programs, demand is captured as **new** and **return** appointments. Specialists provide the greatest value to the health care system when they see new patients. The key is to minimize the delay for these appointments. New appointments compete with return appointments. Collecting data on the demand for new and return appointments is critical in improving access to specialists.

3.2.1.1 Determining your Demand Units

Before you can start collecting demand you will need to determine the units of time (*i.e.* time slots) you will be collecting it in. As demand, supply and activity are collected as a set you will need to ensure your units of time are the same for each of these measures.

To do so, determine the common increment of time amongst:

- All of your appointment types

- All of your providers

Example

All appointments for all providers are booked in increments of 10 minutes. Therefore, your units for demand, supply and activity are 10 minute slots.

3.2.1.2 Measuring Demand

To measure demand, the person or people scheduling appointments must keep a daily record of the number of appointments booked today irrespective of the day of the appointment for each provider.

Each day, everyone in the clinic who books appointments needs to record demand for both categories (internal and external for primary care, and new and return for specialty care) for each provider.

This may mean using multiple copies of the *Weekly Demand Tabulation Sheet (toolkit)* and keeping them available for use wherever appointments are being booked in the clinic.

The daily record (tally) of demand for each provider is kept by making a “tick” for each standard time slot booked.

Example

If your D/S/A units are 10 minute slots:

- an appointment booked for 30 minutes = 3 ticks
- an appointment booked for 60 minutes = 6 ticks

When counting demand, count demand for the panel physician, (the requested provider), even if that provider is unavailable that day and the patient is seen by someone else. This is still demand for the panel physician.

At the end of each day, all demand tabulation sheets should be gathered up and the number of booked appointments for each provider should be totaled by type and entered into the *AIMTracking* file.

3.3 Panel/Caseload Size

3.3.1 Panel Size (Primary Care)

In primary care, panel size is the **number of unique patients for whom a provider is responsible for providing care**. A group or individual’s ability to do all of today’s work today is directly related to the size of their patient panel. The panel size appropriate for an individual provider will depend on several factors:

- How often a provider is in the office
- The risk associated with caring for a specific population of patients

- The provider's scope of practice
- Age, sex, and acuity of the patient population

Panel size is an important tool for anticipating demand. Experience shows that between .75 to 1% of a provider's panel will call for an appointment on a given day. Therefore, demand is formally linked to panel size. A large panel will create demand commensurate with its size. Managing panel size (age and sex adjusted) is an important way to level demand across a system of providers and to shape demand on a daily basis.

In a fee for service environment, panel size is the number of unique individuals who have seen a provider in the practice and for whom the provider coordinated the majority of care over the last 18 months. This includes patients who have been seen at greater than yearly intervals. When querying the computer system for this information, remember that it is not simply the number of patients (or patient count) seen in the previous 18 months, but the number of unique patients seen. If a computer system records the patient's primary provider, this information should be easy to obtain. However, until continuity becomes a system property, it could happen that a patient may appear on several providers' panels. In this case, tiebreaker logic is used to determine which panel the patient should be on. Common tiebreakers are the provider seen most often, or the provider seen for a physical. Track panel size at prescribed intervals, as it may change based on deaths, births, moves or other circumstances.

In practices where the panel size is unknown, it may be necessary to calculate the number of unique individuals who have seen any one of the providers in the practice over the last 18 months. This number gives a rough estimate of the patients who "belong" to the practice. For best access and best outcomes, it is important for the clinic to take this practice panel data and break it down to determine panel at the individual provider level.

3.3.1.1 Measuring Panel Size

To calculate a physician's panel size, use the EMR or file system to identify the number of unique unduplicated patients currently receiving care from that physician. Data may also be made available by Alberta Health and Wellness (AHW) to assist in this process.

3.3.1.2 Practice Panel and Current Panel

The current panel for the practice and individuals within the practice can commonly be determined by reviewing the panel identification in the EMR. While there may be some "orphan

patients" not yet linked to a specific provider, the sum of all patients identified with individual providers plus the orphans will equal the practice panel.

In environments where there is no EMR or other means to accurately identify, link and track paneled patients, the four-cut method described in the published articles can be used to perform this function. First, all patients seen by any provider in the practice in the last 18 months are identified. This is the practice panel and will include orphans since, while they may not be linked to any specific provider, orphans have at least been seen by someone in the practice. From there, patients are further divided as follows:

- **First cut**: Those patients seen by only one provider in the practice are assigned to that provider.
- **Second cut**: Those patients seen by more than one provider in the practice are assigned to the provider they saw most frequently.
- **Third cut**: Those patients seen by more than one provider in the practice the same number of times are assigned to the provider who performed some form of bonding exam (*i.e.* a "physical").
- **Fourth cut**: Those patients seen by more than one provider the same number of times but without any clear bonding exam are assigned to the provider who saw them last.

In this way, all patients seen by anyone in the last 18 months are linked to a specific provider. This is the current panel for all individual providers and the sum of all the individuals will equal the practice panel.

3.3.1.3 Target or Shared Panel

The "target" or shared panel is the term that looks at a theoretical division of the current practice panel in proportion to full-time equivalent (FTE) worked by each provider. For example, in a practice of five providers, three of whom are full-time and two of whom are half-time, the total clinical FTE is 4. If the practice panel was identified as 10,000 unique patients, and the workload was "shared" equitably, the three full-time providers would have panels of 2500 and the two half-time providers would have panels of 1250. The target panel can be compared to the current panel and an analysis of who is over and who is under their "target or "share" can be determined. The sum of the over plus the under will equal zero.

3.3.1.4 Ideal Panel

The ideal panel can be derived using the following panel formula, as outlined in the published articles:

Panel Size **X** # of Visits per Patient per Year	=	# of Visits per Office Day **X** # of Days Worked in the Office per Year

Therefore the ideal panel size a provider can support is:

$$\textbf{Ideal Panel Size} = \frac{\text{\# of Provider Visits per day X \# of Days Worked in the Office per Year}}{\text{\# of Panel Patient Visits per Year}}$$

This equation is not immutable. It can be influenced in order to change the ideal panel number or the variables can be changed in order to accommodate a fixed and unchangeable panel size number. The ideal panel for each individual can be compared to the current panel and viewed as over/under. The sum of the over and under will not equal zero.

With a dataset of the provider's panel, additional valuable information can be obtained such as demographics, age and sex distribution, health needs, common diagnoses, hospitalization rates, patient utilization and identification of shared patients between primary care and specialty services.

Example – Calculating an Ideal Panel Size

Dr. Smith works every Monday - Thursday at the Happy Clinic. Every Friday she volunteers at an inner city clinic.

When she is at the Happy Clinic she sees about 30 patients a day. With vacation and stat holidays she works 176 days per year (4 days per week * 44 weeks worked per year) at the Happy Clinic and on average each of the patients belonging to her Happy Clinic panel will visit her 3 times per year.

Currently Dr. Smith's Happy Clinic ideal panel size is:

$$\text{Ideal Panel Size} = \frac{\text{30 visits per day * 176 days worked per year}}{\text{3 panel patient visits per year}} = \frac{\text{5280 visits per year}}{\text{3 panel patient visits per year}}$$

$$= \textbf{1760 panel patients}$$

If Dr. Smith was able to reduce how often each of her Happy Clinic panel patients visited her to 2.5 days per year her ideal panel size would increase to:

$$\text{Ideal Panel Size} = \frac{\text{30 visits per day * 176 days worked per year}}{\text{2.5 panel patient visits per year}} = \frac{\text{5280 visits per year}}{\text{2.5 panel patient visits per year}}$$

$$= \textbf{2112 panel patients}$$

3.3.1.5 Panel Reports

A panel report, based on AHW billing data, is available from Alberta Health & Wellness as a starting point to determine your patient panel. The four cut methodology is used to determine this information. This report is a starting point only, establishing a process to keep accurate panel information in your clinic that is easily accessible, is important.

Speak with your facilitator about how to access a form to request the AHW panel information and about any concerns (*e.g.* confidentiality) your team may have.

3.3.2 Caseload Size (Specialty Care)

Caseload is the term used in specialty care to describe the **number of patients for whom the provider is responsible**. However, there are two major differences between panel in primary care and caseload in specialty care. While panel implies a long-term linkage, caseload implies a temporary relationship. Second, in primary care, the new workload is a small part of the overall work, whereas in specialty care new work is the most valuable component of the workload.

A specialty physician's caseload is made up of patients from several primary care physicians' panels. In specialty practices/programs, it is important to understand the provider's caseload size, or the number of unique patients actively receiving care within a given 12 month period of

time. Knowledge of caseload size helps the specialist balance supply of and demand for appointments.

If we cannot identify current caseload within a specialty care practice we can use the four-cut method described above. The ideal caseload equation is critical in specialty care just as it is in primary care:

# of Patients **X** Expected Number of Visits per Patient	**=**	# of Visits per Office Day **X** # of Office Days Worked

Refer to the *Example – Calculating an Ideal Panel Size* section above to see how an ideal caseload would be calculated.

3.3.2.1 Measuring Caseload

To calculate a physician's caseload, use the EMR or file system to identify the number of unique unduplicated patients currently receiving care from that physician.

3.4 Continuity

3.4.1 Primary Care

Continuity is a measure of **the likelihood that a patient will see his/her own primary care provider when receiving care**. Interpersonal continuity defines the important relationship between the family doctor and his/her patients. It is well documented that continuity contributes to significant improvement in patient health outcomes, increased patient and provider satisfaction, decreased demand, decreased visit return rates and overall lower costs to the health care system. Continuity is most significant at the individual provider level. A strong relationship between patient and physician/provider helps to generate patient trust with the other team members in the clinic. In this environment, team members are able to function to the best of their ability.

Continuity is measured from the patient's perspective - what is the likelihood a patient will see his/her own primary care provider? Continuity is based on retrospective data. In order to collect continuity data, accurate provider panel data is required. Continuity is measured retrospectively over the previous month.

3.4.1.1 Measuring Continuity

$$\text{Provider's Continuity} = \frac{\text{Visits by my panel patients to me}}{\text{Total visits by my panel patients to the clinic}}$$

At the end of the month, for each provider:

- count the total number of panel patient visits to their own provider that month
- count the total number of panel patient visits to the clinic that month (*i.e.* visits to their own provider + visits to other providers in the clinic)
- record **both values** in the Continuity tab in the *AIMTracking* file - because Continuity is graphed as a % it's important BOTH values are collected

Example

At the end of the month Sally measures Dr. Smith's Continuity:

- She counts a total of 400 visits by Dr. Smith's panel patients to Dr. Smith that month
- She then counts 80 additional visits by Dr. Smith's panel patients to other providers in the clinic that month

Dr. Smith's Continuity =	400 visits	
	(400 visits + 80 visits)	
=	0.8333 x 100	
=	**83 %**	

3.4.2 Specialty Care

While continuity (the likelihood that a patient will see his/her own provider) is traditionally a primary care concept, there are applications of the same concept in specialty practice. Continuity is usually a system property in specialty care. It is rare, except in some academic environments, for specialty care providers to see each others' patients. It is most important that there be continuity to the specialty provider within the episode of care, and for subsequent

episodes of care with a same or similar diagnosis. For example, if a patient is referred to cardiology for management of severe hypertension, continuity to the same specialist for the period during which the blood pressure is stabilized is important. After the patient is stabilized, he/she returns to primary care. If a subsequent referral to cardiology is required (because the patient's blood pressure is again out of control), it would be best managed by the same cardiologist as the initial episode. However, if a patient is referred to a dermatologist for psoriasis, and then subsequently requires a referral for a melanoma, the continuity between episodes of care is less important.

3.5 Supply

Supply is the measure of provider capacity or availability. Advanced access systems rely on adequate and flexible supply. It is helpful to think of supply in three dimensions:

- Macro supply - the number of providers time the number hours each works
- Deployment of supply - the way macro supply is spread throughout the day, week, month and year
- Process of supply - defining the work and who should do it to optimize supply

There are several ways to measure the dimensions of supply. Provider full-time equivalents (FTEs) and appointments per session are used to measure macro supply.

3.5.1 Supply of Appointments

Supply of appointments per session is another important measure that looks at how many patients per specific period each provider is capable of seeing under the current system. This is a further refinement of macro supply. It is a rough calculation of approximately **how many appointment slots each provider or a system of providers has available.** It is a prospective measure (*i.e.* what was planned).

Supply data provides important information, especially when compared to demand. For example, if the demand for a physician averages 125 appointments per week and the average supply of appointments that physician has is 96, then supply and demand are mismatched, and the physician will develop a backlog of patients who are waiting to see him/her. Supply and demand can be balanced by adding supply and/or reducing demand.

3.5.1.1 Determining your Supply Units

Before you can start collecting supply you will need to determine the units of time (*i.e.* time slots) you will be collecting it in. As demand, supply and activity are collected as a set you will need to ensure your units of time are the same for each of these measures.

To do so, determine the common increment of time amongst:

- All of your appointment types
- All of your providers

Example

All appointments for all providers are booked in increments of 10 minutes. Therefore, your units for demand, supply and activity are 10 minute slots.

3.5.1.2 Measuring Supply

At the beginning of the week, count the number of standard appointment slots available (filled and unfilled) for each provider to see patients for each day of the week your clinic/program is open.

Record your count on the *Weekly Supply and Activity Tabulation Sheet (toolkit)* for entry into the *AIMTracking* file at a later time (*e.g.* the end of the week).

Example

On Monday morning Sally looks at Dr. Green's schedule. Similar to his colleagues, Dr. Green books out all of his appointments in 10 minute slots.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 AM - 8:10 AM	booked	day off		day off	booked		
8:10 AM - 8:20 AM	booked	day off		day off	booked		
8:20 AM - 8:30 AM	booked	day off		day off	booked		
8:30 AM - 8:40 AM	booked	day off		day off	booked		
8:40 AM - 8:50 AM	booked	day off		day off	booked		
8:50 AM - 9:00 AM	booked	day off		day off	booked		
9:00 AM - 9:10 AM		day off	booked	day off	booked		
9:10 AM - 9:20 AM		day off	booked	day off			
9:20 AM - 9:30 AM	booked	day off	booked	day off			
9:30 AM - 9:40 AM	booked	day off	booked	day off	booked		
9:40 AM - 9:50 AM	booked	day off	booked	day off			
9:50 AM - 10:00 AM	booked	day off		day off			
10:00 AM - 10:10 AM	booked	day off		day off			
10:10 AM - 10:20 AM	booked	day off		day off	booked		
10:20 AM - 10:30 AM	booked	day off		day off	booked		
10:30 AM - 10:40 AM	booked	day off	booked	day off	booked		
10:40 AM - 10:50 AM	booked	day off	booked	day off	booked		
10:50 AM - 11:00 AM	booked	day off		day off	booked		
11:00 AM - 11:10 AM	booked	day off	booked	day off			
11:10 AM - 11:20 AM		day off	booked	day off			
11:20 AM - 11:30 AM		day off	booked	day off	booked		
11:30 AM - 11:40 AM	academic work	day off	booked	day off	booked		
11:40 AM - 11:50 AM	academic work	day off	booked	day off	booked		
11:50 AM - 12:00 PM	academic work	day off	booked	day off	booked		

For each day of the week, Sally counts the number of filled and unfilled 10 minute slots Dr. Green has available on his schedule to see patients.

Weekday	# of Filled 10 Min Slots	# of Unfilled 10 Min Slots	Total Supply (Filled + Unfilled 10 Min Slots)
Monday	17	4	21
Tuesday	0	0	0
Wednesday	13	11	24
Thursday	0	0	0
Friday	17	7	24

Sally then records the total supply values on the *Weekly Supply and Activity Tabulation Sheet (toolkit)* for Dr. Green.

3.5.2 Provider Full Time Equivalents (FTEs)

NOTE: a tab for collection of this measure is not included in the *AIMTracking* file.

The number of providers available, expressed as full-time equivalents (FTEs), is the most basic measure of supply.

3.5.2.1 Measuring Provider Full Time Equivalents (FTEs)

Count the number of FTE providers in the office on a daily, weekly, and monthly basis. This data is often surprising and offers insight into demand and capacity management. For example, the data may show four provider FTEs available on a Monday, traditionally the highest demand day. Alternately, the data may reveal seven provider FTEs on Thursday, one of the lower demand days. This indicates a need to manage provider days in the clinic in a different way to better match supply and demand.

3.6 Activity

Another dimension of capacity is activity, or "supply used." In many busy practices, and due to a variety of circumstances, a provider may end up seeing more patients than he/she has appointment slots for. Conversely, if patients don't show up for their appointments, a provider may in fact see less patients that he/she has appointment slots for. Activity is therefore a retrospective look at the **number of appointment slots that were actually used** in a particular day, week, month or year. Activity is measured as follows:

Activity = Appointments Booked + Squeeze Ins* – No Shows

* add your squeeze ins ONLY if they are not already accounted for on your scheduling system

3.6.1 Determining your Activity Units

Before you can start collecting activity you will need to determine the units of time (*i.e.* time slots) you will be collecting it in. As demand, supply and activity are collected as a set you will need to ensure your units of time are the same for each of these measures.

To do so, determine the common increment of time amongst:

- All of your appointment types

- All of your providers

Example

All appointments for all providers are booked in increments of 10 minutes. Therefore, your units for demand, supply and activity are 10 minute slots.

3.6.2 Measuring Activity

At the end of the day, for each provider:

- count the number of standard appointment slots booked
- count the number of standard appointment slots squeezed in (*ONLY if they are not already accounted for on your scheduling system)
- count the number of standard appointment slots for those who didn't show up for their appointments that day
- calculate the activity using the following equation:

Activity = Appointments Booked + Squeeze Ins* – No Shows

- Record your count on the *Weekly Supply and Activity Tabulation Sheet (toolkit)* for entry into the *AIMTracking* file at a later time (*e.g.* the end of the week)

Example

At the end of the day Sally looks at Dr. Green's schedule and notes:

- 26 – 10 minute slots were booked (including 3 squeeze ins)
- 1 – 10 minute slot was not used because the patient no showed
- **Activity = 26 – 1 = 25**

Sally then records the daily activity value on the *Weekly Supply and Activity Tabulation Sheet (toolkit)* for Dr. Green for that day.

3.7 No Shows

No-shows are **patients who fail to keep their scheduled appointments**. No shows can increase staff work and reduce provider productivity due to lost appointment time, since the vacant appointment cannot be assigned to another patient. No-shows may also negatively affect patient health as a result of the patient not seeing the provider when he/she was booked. Collecting this data can determine whether or not no shows are a significant problem for the clinic, and if they are, strategies to reduce the no-show rate can be tested and implemented.

3.7.1 Measuring No Shows

At the end of the day, for each provider:

- count the total number of patients who did not keep their scheduled appointments
- count the total number of patients booked for an appointment (including those who no showed)
- record **both values** on the *Weekly No-Show Tabulation Sheet (toolkit)* for entry into the *AIMTracking* file at a later time (*e.g.* the end of the week) – because No Show is graphed as a % it's important BOTH values are collected

NOTE: teams have the option to collect no show data using # of appointments (bodies) or time slots as the units of measure.

Example

At the end of the day Sally looks at Dr. Green's schedule and notes:

- 1 patient no showed
- 25 appointments were booked (including the no show appointment)

[**4 % No Show Rate** = (1/25 x 100)]

Sally then records **both** values on the *Weekly No Show Tabulation Sheet (toolkit)* for Dr. Green for that day.

4 Efficiency Measures

Efficiency measures are key in determining the flow and timing of work in the clinic. The measures provide direction and feedback on improvements made, by helping teams to decide what changes to test, and determine whether the changes are successful.

4.1 Cycle Time

Cycle time is the recommended measure to assess the status of, and later improvements in, patient flow and process efficiency in the clinic. It is simply the **time from when a patient enters the office or clinic "check-in", until the patient leaves "checkout"**.

Cycle time is divided into the following subsets, each depicting an important aspect of the process:

- Time from check-in to rooming
- Time from rooming until the patient sees the provider
- Time with the provider (red-zone)
- Time with nurse in follow-up (including any delays)
- Time at ancillary areas (including delays)
- Time from last clinical contact through check-out (including delays)

It is important to track cycle time not only to measure progress on efficiency improvements, but to make sure that patients are not getting appointments easily, only to find themselves spending a long time in the waiting room, or waiting at other stages of their visit to the clinic.

4.1.1 Sampling

Clinics without an information system that easily tracks patient arrival times can gather this information manually by sampling a manageable number of patients (*e.g.* 4) per provider within a certain time span of interest (*e.g.* first appointment, appointment before lunch, appointment after lunch, last appointment) on a selected day.

Focus on collecting cycle time data for a specific provider on a selected day rather than

randomly collecting a few samples for numerous providers within a day. Strive to collect a representative sample for each provider for each weekday.

4.1.2 Collecting Cycle Data

Use the *Cycle Time Collection Sheets* (toolkit) to collect this data.

Prior to the start of the day determine:

- which provider you'll be sampling
- which appointment type (*i.e.* short, long, new or return) you'll be sampling
- which appointment times you'll be sampling (*e.g.* first appointment, appointment before lunch, appointment after lunch, last appointment)

Prepare the *Cycle Time Collection Sheets* (toolkit) such that they're easy to give to your selected patients when they arrive (*e.g.* fill in the date, appointment time, provider name and appointment type)

Provide each selected patient with their prepared *Cycle Time Collection Sheet* (toolkit) on a clipboard and ask them to fill it in as they move through the steps in their visit. Make sure they record the time of day (*e.g.* 10:15 a.m.), and not the length of time (*e.g.* 5 minutes).

Tip - provide patients with a watch to help with the data collection.

Collect each *Cycle Time Collection Sheet* before the patient leaves – quickly check the data to ensure it is complete. Enter the data from the *Cycle Time Collection Sheets* into the *AIMTracking* file.

4.1.3 Scheduled Arrival Time and Scripting

The flow, as measured by the cycle time, can be optimized by having an explicit arrival time and explicit appointment time with the doctor time. This helps patient flow through the office, team functioning and the overall measurement process.

Example front desk script:

"Your scheduled arrival time to prepare for the appointment is 0800 a.m. and your scheduled

appointment time with the doctor is 0815 a.m".

4.2 System Mapping

System mapping is a way to identify and clarify each step of a process in order to improve that process. By mapping a process, the team can discuss, test, and implement ways to improve processes within the daily flow of work, thus becoming more efficient. It is often surprising how various members of a team hold different views of the key steps in a process.

Learning to use system mapping is best accomplished by starting with something seemingly simple that everyone knows how to do, such as brushing teeth or making a pizza.

- Record each of the process steps on a separate sheet of sticky paper
- Put the steps in the right order
- Be sure to record who is responsible for each step
- Discuss the steps, and rearrange them if necessary
- Add forgotten steps
- For mapping larger processes, you may want to group the smaller detailed processes to make a higher level flow map

By the end of the exercise, the team should agree on the steps, the order, and who is responsible. When all team members agree on the steps and the order, analyze the process:

- Is there a simpler, less complex way to do the process?
- Are there steps that have become obsolete or are not necessary? If so, eliminate them
- Is the right person currently doing the task? All team members should be working to the highest level of their licensure. Look at who is doing the steps, and whether he/she is the right person for the task? If not, determine who should do the task
- Minimize hand-offs
- Construct a new way to execute the process, test it, make further changes, as required, and then implement it
- Make sure the process is documented correctly and clearly, and that all documented processes are kept in a place where team members can access them

5 Team Measures

5.1 Operational Teams

The hallmark of good “operational teams” is speed and efficiency for a patient. A measure of this aspect of the work is cycle time as discussed above.

5.2 Clinical Teams

The hallmark of good “clinical teams” is the number of aspects of evidence-based care provided to the clinic’s patient population.

5.3 Teams and Team work

Producing desired outcomes requires excellent teamwork. **Your facilitator has access to a number of team work resources. We recommend your clinic/program spend time to engage in a formal team work development process and decide which set of resources will support your clinic/program best.**

6 Outcome Measures

A major goal of AIM is to enhance the success of and quality in an organization. Success can be measured relative to patient, provider and staff satisfaction, and clinical and financial outcomes. Many organizations already have systems in place to measure these important parameters. Measures should reflect the paradigm shift required as a result of the changes being implemented. For example, patient satisfaction measures should include wait for an appointment, wait at an appointment, and continuity with the provider of choice.

Measure	Measure Shows	Initial Frequency	Maintenance Mode
Patient Satisfaction	Degree of patient delight	Initially	Quarterly
Staff Satisfaction	Staff morale	Initially	Quarterly

Measure	Measure Shows	Initial Frequency	Maintenance Mode
Provider Satisfaction	Provider morale	Initially	Quarterly
Health Outcomes	Clinical efficacy	Initially	Annually; more often if possible
Financial Outcomes	Productivity and efficiency	Initially	Annually; more often if possible

7 Summary of Measures

The following table summarizes the measures to be entered into the *AIMTracking* file. It provides a quick reference to the reason for and activities associated with each of the measures.

Measure	What it Means	Why It is Important	Who Collects/ Calculates	When to Collect/ Calculate
Delay	The wait time for an appointment. A measure of the time between today and the day the third next "open space" appears on the schedule	Provides feedback on the amount of time a patient has to wait to see the provider. Is also a measure of the success of backlog reduction	Scheduler or Office Manager	Measure at the same time and day each week (*e.g.* Wednesday at 10:00 a.m.) for each provider
Demand	The number of standard appointment slots booked today (calls, fax, email, walk-in, squeeze-in, follow-up)	Provides information on variation and better enables clinics to match supply with demand.	Everyone who books appointments	Daily for each provider using the EMR or a manual tally sheet.
Supply	A prospective measure of the number of standard appointment slots each provider has to offer each day – i.e. slots available to see patients	Provides information on the planned number of appointment slots each provider has to supply. Used to look at the balance between supply and demand	Scheduler or computer query	Weekly (*e.g.* collect at the beginning of the week for each day of the week) for each provider
Activity	A retrospective measure of how many available standard appointment slots were used. This is a measure of provider productivity. (Booked Appts + Squeeze Ins – No Shows)	Provides information on how much work was completed each day	Scheduler or computer query	Daily for each provider
Panel Size (Primary Care)	The number of unique individuals who have seen a provider in the practice for whom the provider has coordinated the majority of care over the last 18 months	Panel size provides information about which patients and providers have a relationship. This measure helps the practice anticipate demand	Office Manager (computer query)	Monthly for each provider

Caseload (Specialty Care)	The number of unique patients actively receiving care within a given 12 month period of time	Caseload size is an important tool for anticipating demand. This is a measure of how the new patients are divided. The goal is to achieve an equitable distribution between providers	Office Manager, (computer query)	Monthly for each provider
Continuity	The count of visits by a provider's own patients to that provider, divided by the total visits by that provider's patients to the clinic. Continuity is measured retrospectively using patient visit information over the previous month. Continuity cannot be calculated until patient panels/caseloads have been defined	Improvements in continuity leads to better patient outcomes, increased patient and provider satisfaction, decreased demand, decreased return visit rates and lower no show rates	Office Manager, (computer query)	Monthly for each provider
No-Shows	The number of patients who fail to keep their scheduled appointments	Contribute to wasted appointment supply and non-productive provider and staff time, and result in re-work (the need to re-schedule the visit)	Scheduler or computer query	Daily for each provider
Cycle Time	A measure of the total amount of time a patients spends in the clinic from check-in to check out, including the amount of time spent at each step of the office visit	Provides information on office efficiency and patient flow, as well as the delay the patient experiences during the office visit	Front desk staff provide patients with collection sheets to record the time as they reach various points in their visit	The key is collecting a representative sample – *e.g.* per appointment type, measure for approximately 5 patients per physician throughout the day for each day of the week
Teamwork (tools may vary - no tab in *AIMTracking* file)	A measure of the team's state of health	Identifies teamwork needs, and allows the team to develop as they adapt to the changes taking place.	Every team member	Early on, as a baseline measure. Periodically thereafter.