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Using Run Charts to Measure Improvement

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Introduction

This is short tutorial on using run charts to measure performance improvement (PI) of health care processes. Use of run charts requires understanding the context of a health care process that is measured, identifying non-normal variation in a process, knowing when to intervene in a process, and knowing when to do nothing. The branch of statistics commonly used for analyzing and interpreting PI data is Statistical Process Control (SPC).¹ SPC was designed for those with no formal statistical training.² Commonly used SPC tools include run charts and the slightly more complicated control charts.³

Process Variation

A process in a PI plan is a series of steps toward some goal. There are many health care processes that are measured, such as body mass index, inpatient body temperature, or vaccination rates. Process measures vary over time with patterns of highs and lows. In SPC, these process variations are categorized as normal (or random), non-normal (non-random), common cause, or special cause. Common cause is variation that is typical of the process, is found within the process, and is a part of the normal process. In a planned PI project, if the performance of the process is acceptable, then the best strategy for common cause variation is to do nothing. There is one exception. In cases where the pattern is common cause, but the desired overall performance is not acceptable, then the strategy is to find and eliminate all the common causes.⁴

Special-cause variation is due to something that is not typical of the process. Special cause variation found in a control chart requires searching for and deciding whether to eliminate the cause of the variation. The terms common and special cause variation are recommended to be used with control charts.⁵

Normal or random variation is due to ordinary causes affecting all the outcomes in a process. Non-normal variation

is due to non-ordinary causes affecting some but not all parts of the outcome in a process. Run charts provide signals of non-normal variation in a process.

Run Charts vs. Control Charts

A run chart is the simpler of the two SPC charts. Control charts require calculations of statistical limits and at least twenty points of data.² Run charts do not use limits and require a minimum of ten data points.⁶ Run charts provide a visual display for data and movement of process variation over time.⁷ Basic skills needed for run charts include knowing the type of data variable, how to calculate the median value of the data, how to plot the data for the chart, and how to apply the four run chart rules. The run chart shows which direction the process is going, i.e., increasing or decreasing, toward a desired goal. If the goal is to increase a process and the run chart shows a shift or trend that is decreasing, then an action may be necessary to change the direction of the process. If the shift or trend is increasing and that is the desired direction, then the action may

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be just to encourage the process that is in place and to do nothing.

Control charts provide information on the type of variation, and whether a process is stable based on calculated control limits around the center line of the data. Stability is based on whether a process has been sustained (i.e., in statistical control) by an intervention, or if an intervention has resulted in real improvement in a process.⁵ Stability, or statistical control, is a 99.7% probability that the points for the process are within the upper and lower limits from the center measure of the data.⁸

The goal for measuring health care PI using data is to find either special cause (using a control chart) or non-normal variation (signaled by a run chart) in a process. Once the variation is found or signaled, and the data is not moving in the desired direction, then the process must be investigated to find the cause of the variation or signal. A decision must then be made about whether an action is needed to eliminate the cause of the variation.

Run charts signal non-normal variation in a process. Four rules are used to determine the signals. Run charts cannot tell if a process is stable, unless there is a very large number of data points and with no signals of non-normal variation. Control charts interpret special cause and process data stability. For these reasons, run charts should not be confused with control charts.⁵ Control charts use five rules for interpretation of the process stability. Rules for runs and controls should not be used interchangeably.

How to create a run chart

Data can be collected to chronologically measure the PI process using an excel spreadsheet. Label each column in the spreadsheet for the data. Three columns are required to create a basic run chart: the “y” axis process data (plotted on the vertical side of the chart), the “x” axis time data (plotted on the horizontal side of the chart), and the column for the calculated

Table 1. Colon cancer screening rates (hypothetical data); the calculated median and the percent goal

Month	Rate of Colon Cancer Screening	Median	% Goal
January	13.4	14.3	30
February	13	14.3	30
March	15.3	14.3	30
April	12.4	14.3	30
May	12.7	14.3	30
June	12.6	14.3	30
July	13.6	14.3	30
August	14.3	14.3	30
September	15.7	14.3	30
October	15.9	14.3	30
November	20.9	14.3	30
December	23.2	14.3	30
January	27	14.3	30

median of the process data (plotted as the center line in the chart). Other columns may be added if desired, such as the goal.

An example is shown in Table 1. The hypothetical data is based on rates for the number of colon cancer screenings for adult patients seen in a clinic per month. There are thirteen points representing thirteen monthly rates for colon cancer screening. The sample is the number of eligible adult patients seen in a clinic during each month beginning with January 2011 and ending with January 2012. Data is plotted chronologically from the start date of the process. Connecting the dots using a two-dimensional line makes it easier to see the progressive movement of the points in the process.

To calculate the median of the process, which is the middle number of a set of numbers, rank the numbers from smallest to largest. If there is an uneven number (which is the case for the data in Table 1), the median is the middle number (shown in Table 2). If there is an even set of numbers, rank the numbers, smallest to largest. Next take the two middle numbers. Add these two and then divide by two. The resulting number will be the median. An easier method is to use the function (fx) key in excel. Place your cursor in the cell in the spreadsheet where you want the median to be listed. Click on “fx” and type in “median” in the “search for a function” box. Click on “median” and then click “go.” Click on the icon on the right side of the function box that is labeled “number 1.” Highlight the cells in the excel column for the median calculation and click “ok.” The median will appear in the cell where the cursor was placed at the beginning. The median is put into a third column in the Excel spreadsheet. The median calculated for the process data in Table 1 is 14.3.

To create the run chart using excel, highlight the data points in the columns to be used in the chart. For example, in Table 1, to create a run chart with the % goal, highlight the columns “Month,” “Rate Colon Cancer Screen,” “Median,” and “% Goal.” Next click on “insert” tab found in the top ribbon. Click “Line” and then in the drop down menu click “2-D line chart.” The chart will be created in the spreadsheet for further formatting or editing in the chart tools. To clarify the

Table 2. Colon cancer screening rates from Table 1 ranked to determine median

Unranked	Ranked
13.4	12.4
13	12.6
15.3	12.7
12.4	13
12.7	13.4
12.6	13.6
13.6	*14.3
14.3	15.3
15.7	15.7
15.9	15.9
20.9	20.9
23.2	23.2
27	27

Table 3. Partial statistical table taken from another source that can be used for checking for too few or too many runs in a run chart³

Total number of data points on run chart that do not fall on median	Lower limit for number of runs (< than this number runs is 'too few')	Upper limit for number of runs (> than this number runs is 'too many')
10	3	9
11	3	10
12	3	11
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16

run chart for the reader, add the title, a note as to when a change or intervention was made, include the sample size and notes on any external events that may have had an impact, and any other points of information that may be of interest to understand the chart.⁶

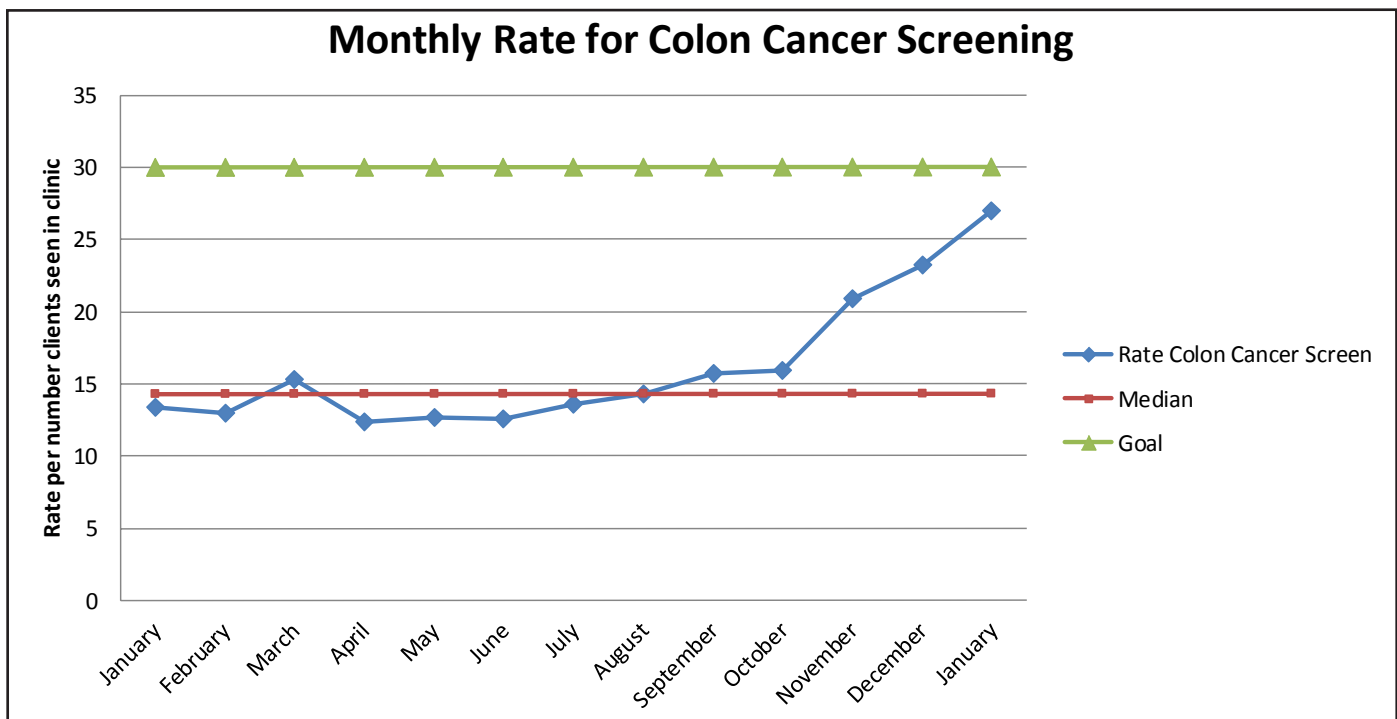
The resulting run chart is shown in Figure 1. The median is the horizontal line in the middle of the data. The rates of

colon cancer screening are plotted above, below, or directly on the median for each of the time measures. The % goal is shown as a visual to depict where the process is in reaching the desired goal. Based on the data plotted in run chart one, answer the following three questions:
 Are there any signals of non-normal variation in the process?
 Is the colon cancer screening process increasing the rates?
 Is the colon cancer screening process under control?

Analyzing run chart signals

In order to answer the questions, first count the number of data points. Do not count the dots on the median, which is the center line. In this case, there is one point on the median (August), so instead of the thirteen total points, twelve is used for the number of points not on the median. Look at the data in Table 1 to see if a point is on the median, if you cannot tell by looking at the chart. Next count the number of runs. A run is a series of dots above and below the center line.⁹ The points cross the median four times,

Figure 1. Rates per month for colon cancer screening provided to eligible adult ambulatory care patients (n = 360) seen in clinic over one calendar year beginning with baseline month January 2011 to end month January 2012.*



* Multidisciplinary PI project began January 2011 to increase colon cancer screening rates for eligible adult patients seen at clinic A. The goal was to increase rates from baseline rate in January 2011 to 30% by January 2012.

which gives two runs above the median and two runs below the median. Next, use the following four rules to identify non-normal variation in Figure 1.

Rule #1: A shift in the process or too many data points in a run; six or more consecutive points above or below the median indicates a shift. Six or more consecutive points above or below the median are not found in Figure 1; this indicates no shifts and does not signal non-normal variation.

Rule #2: A trend of five or more consecutive points all increasing or decreasing. There are seven points beginning at point seven in July and all are increasing. This is an increasing trend and signals non-normal variation.

Rule #3: Too many or too few runs. In the Figure there are too few runs based on Table 3 (statistical table for tests for too few or too many runs⁵). For twelve data points (shown in column 1 “Number of data points”), there should be three runs below the median (column two “Lower limit for number of runs”) and eleven runs (column three Upper limit for number of runs”) above the median to establish normal variation.⁵ Figure 1 has two runs above and two runs below the median. This signals non-normal variation.

Rule #4: Is there an obvious and blatantly different point (also called an astronomical point) that is not just a high or low point?⁵ The last point is very large but not blatantly different, so does not signal non-normal variation.

Analysis of Figure 1 using the four rules finds that two rules signaled non-normal variation in the colon cancer screening process. There was an increasing trend (rule 2), and too few expected runs (rule 3). Now the questions can be answered.

Answer to Question 1: There is non-normal variation in the run chart.

Answer to Question 2: The process of colon cancer screening shows an increasing trend in the rates.

Answer to Question 3: To answer the question whether the colon cancer screening process is now under control cannot be answered with this run chart. Either more data must be collected until no signals for non-random variation is found, or the data must be plotted in a control chart.

Based on the signals for non-normal variation, there is no indication to change the process because the rates have an increasing trend toward the desired goal of 30%. Since the goal was not achieved within the set time, the PI process should be

investigated to assure the planned process is being followed by all individuals. If the run chart signaled a decreasing trend, then an action plan or intervention would need to be initiated to change the process.

Summary

This is a basic tutorial for using run charts to measure health care PI. Many references are available for a more in-depth review of run charts, control charts, and SPC rules with different types of data. Run charts are simple tools providing a visual display for data and movement of process variation over time⁷. Run charts assist in assessment of health care PI by signaling non-normal variation in a process. The direction of the non-normal variation provides information necessary for knowing whether to intervene in a process or to do nothing.

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Arts-Based Cancer Education for Community Health Workers in Alaska

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In response to Community Health Workers' (CHWs) desire to learn more about cancer, the Alaska Native Tribal Health Consortium sought and received funding from the American Cancer Society (2009 - 13) to develop arts-based cancer education. Among Alaska Native people, cancer became the leading cause of death in the 1990s and remains so today. The arts are an integral pathway among Alaska Native people for sharing knowledge and understanding — giving a mind-body-spirit connection to the learning experience. In the words of one Alaska Native elder,

The arts recognize traditional ways of knowing. A lot of learning today is so intellectual-based we don't engage the heart and the spirit. Sometimes, when you look at a curriculum, if it is too didactic or intellectual, we lose the spirit of it. If you want true behavior change, it is way more than knowledge - it's an honoring of the heart, spirit, and mind.

Building upon the traditions of Alaska Native people, which include the arts as a viable way of knowing, the expressive arts of moving, drawing, and sculpting were incorporated into eight, 5-day cancer education courses for Alaska's diverse CHWs. Evaluation included a pre-course needs assessment, post-course written evaluation, group discussions, extended telephone interviews, and an Internet survey. On written post-course evaluations, all 73 CHW course participants reported increased cancer knowledge, 96%

described ways the arts supported their learning, and 93% felt more confident to share cancer information. Participants also wrote healthy behavior changes they planned to make for themselves, their families, and in their work.

Interactive arts activities were described by cancer education course participants as being culturally appropriate, with wide applicability to engage diverse populations and ages. Arts activities served as a pathway for cancer conversations, deeper understanding, and wellness behaviors.

In the words of one Alaska Native Community Health Worker,

The arts give a comfortable traditional way to share experiences and healing. My people have always shared wisdom through songs, dances, arts. The arts bring a heart and spirit connection to the learning to make it more meaningful. Art is a way of life from the ancients.

Arts-based cancer education activities to compliment the Path to Understanding Cancer manual are posted on the [akchap.org](http://www.akchap.org) website under the cancer and resources tab. Go to <http://www.akchap.org/html/resources/cancer-education/activities.html>.

To learn more about this project, see the following resources:

The arts are an integral pathway among Alaska Native people for sharing knowledge and understanding—giving a mind-body-spirit connection to the learning experience.

1. Cueva M, Kuhnley R, Cueva K. (2013 accepted for publication) The Transformative Experience of Arts-Based Cancer Education. *Int J Circumpolar Health*.
2. Cueva M, Kuhnley R, Revels L, Echohawk C. Creating dialogue, creating change through the arts. *Journal of Cancer Education*. 2012;27(3): 591-3.
3. Cueva M, Kuhnley R, Cueva K. Enhancing cancer education through the arts: building connections with Alaska Native people, cultures, and communities. *International Journal of Lifelong Education*. 2012;31(4): 341-357.

As part of arts-based cancer education, participants are invited to draw what wellness looks like to them, as a respectful opening to meaningful conversations about healthy choices and cancer risk reduction behaviors. Additionally, participants use play dough to sculpt wellness activities that help to decrease cancer risk. This play dough creation symbolizes a basket of colorful berries, rich in antioxidants.



Our Apologies

We apologize for the delay in the production of this issue. Constraints on funding at the end of the fiscal year made it impossible to complete the preparation of the issue until now.

We will catch up with our usual monthly publishing schedule as soon as possible. We are currently accepting submissions for the August issue.

A Review by Any Other Name

Diane Cooper MSLIS, AHIP, NIH Library Services for IHS, Rockville, Maryland

As health care providers, you probably have little time to read the endless flood of original research papers. “Information overload,” a phrase coined in 1970, is even more prevalent today.¹ In 2009 there were over 25,400 journals in science, technology, and medicine, and the number was increasing by 3.5% a year. Also in 2009, those journals contained over 1.5 million articles.²

So how do you keep up with the overwhelming river of medical literature? A review article can serve as a useful and efficient method for interpreting new and developing information on a topic, and can eliminate the need to read many articles. However, is that review article you just read the best, non-biased way to get to the bottom line of what works and what doesn’t? It depends on the type of review.

Generally, reviews can be grouped into two categories: 1) “traditional” literature reviews and 2) systematic reviews. Systematic reviews often include a meta-analysis, which is a statistical combination of two or more studies to produce an estimate of the effect of the health care intervention under consideration.

Characteristics of The Different Reviews

Review articles, often called traditional reviews, do not necessarily look at all the evidence. The authors, who may be experts in the field, often use informal, unsystematic, and subjective methods to collect and interpret information. Maybe they use just the articles that support their viewpoint. The information is summarized subjectively and narratively.³ Methods such as how the literature was searched, how the articles were appraised, and how data were synthesized are not usually described in detail, which can hide bias.

The advantage of traditional reviews is that they are often conducted by experts in the field who may have a thorough knowledge of the subject matter. The major disadvantage, however, is that the authors may have their own preconceived ideas on the topic. Thus, while these traditional reviews can be informative, they often include an element of selection bias because of the articles the authors have chosen to be included in the review. Traditional reviews can also be confusing if similar studies offer different results and conclusions.⁴

Systematic reviews involve an explicit and comprehensive plan of analysis, along with a detailed search strategy to reduce bias. These reviews are based on a specific, formulated question. Systematic reviews use exact methods to identify,

Table 1. Comparing different types of reviews

	TRADITIONAL REVIEW	SYSTEMATIC REVIEW
Scope of the article	Broad topic	Focused clinical question
Inclusion/exclusion criteria for selection of articles	Not specified	Clearly established before review is conducted
Search strategy	Search of literature not explicitly stated	Extensive search of published literature using highly sensitive search strategies
Selection of articles	Not usually stated	Based on established inclusion/exclusion criteria
Evaluation of articles	Article evaluation may or may not be included	Comprehensive evaluation of study quality by a team
Results and Data Synthesis	Summary based on studies where the quality of the articles may not be specified. May also be influenced by the reviewer’s needs or beliefs	Clear summaries of studies based on high quality evidence

select, and critically appraise relevant research articles in order to obtain the best evidence on the question being asked. In addition to a clear set of objectives with pre-defined criteria for studies, systematic reviews include a reproducible methodology. Typically, authors will define the field of literature they will summarize, e.g., “all English language articles published since 2001.” They will set their inclusion and exclusion criteria for the articles. Of the articles that are included, they will evaluate their scientific credibility and summarize their findings in their paper. This is what is meant by “systematic.”

Some systematic reviews include a meta-analysis component. Meta-analysis uses statistical methods to pool results of individual studies to produce a single estimate of effect.⁵

Limitations exist in both types of reviews. Writers of traditional reviews often may have their own agenda to promote, leading to bias. In addition, traditional reviews often cannot be replicated. Systematic reviews have the limitation of answering a narrowly defined question. However, there are major advantages to reading systematic reviews. Systematic reviews reduce bias, are replicable, resolve controversy between conflicting findings and generally provide an evidence based, reliable basis for decision making.

The number of systematic reviews and meta-analyses published in peer-reviewed literature has increased over the last decade.⁶ They have become an essential resource for clinicians who want unbiased and up-to-date answers for their clinical questions and for policy makers who develop quality measures and clinical practice guidelines.

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Print Version of *The Provider* Has Ceased Publication

The federal government is always exploring ways to reduce costs. One recent initiative is an effort to reduce printing expenses. For this reason, we have stopped publishing and distributing the print edition of *The Provider*.

We will continue to publish the monthly electronic edition of our journal to the CSC website. Currently, about 900 individuals are subscribers to the listserv that notifies them when each monthly issue is posted, and lists the contents of

that issue. It is unknown how many readers simply access the website on a periodic basis without relying on the listserv for reminders that the monthly issue is available.

We encourage all our readers to subscribe to the listserv (go to <http://www.ihs.gov/provider/index.cfm?module=listserv>) so that you will receive monthly reminders about when the latest issue is posted to the website. This will also give us an improved count of the number of readers.

POSITION VACANCIES

Editor's note: As a service to our readers, THE IHS PROVIDER will publish notices of clinical positions available. Indian health program employers should send brief announcements as attachments by e-mail to john.saari@ihs.gov. Please include an e-mail address in the item so that there is a contact for the announcement. If there is more than one position, please combine them into one announcement per location. Submissions will be run for four months and then will be dropped, without notification, but may be renewed as many times as necessary. Tribal organizations that have taken their tribal "shares" of the CSC budget will need to reimburse CSC for the expense of this service (\$100 for four months). The Indian Health Service assumes no responsibility for the accuracy of the information in such announcements.

Family Practice Physician Jicarilla Service Unit; Dulce, New Mexico

The Jicarilla Service Unit (JSU) is a new, beautiful 65,000 square foot facility nestled in the mesas of northern New Mexico with views of the edge of the Colorado Rockies. We provide care to the Jicarilla ("Basket-maker") Apache community with a population of 4,400. Our clinic has an opening for a board certified/eligible family practice physician for purely outpatient care with a 40 hour work-week. Our site qualifies for IHS and state loan repayment programs. JSU has a fully functional electronic health record system. Our pharmacy has a robust formulary including TNF-alpha inhibitors and exenatide. The clinic also has an urgent care clinic for acute walk-in cases. Our staff currently consists of an internist, three family practice physicians, an optometrist, and three dentists. We also have a team of dedicated public health nurses who specialize in home visits for elders and prenatal follow-up. The Jicarilla Apache Nation is self-sufficient with revenues from oil and natural gas. Much has been invested in the infrastructure of the reservation, including a large fitness facility, a modern supermarket, a hotel and casino, and more. We are also located 45 minutes from the resort town of Pagosa Springs, which has year-round natural hot springs and winter skiing at renowned Wolf Creek Pass.

We welcome you to visit our facility in person. To take a video tour of the Nzh'o Na'ch'idle'ee Health Center online, go to <http://www.usphs.gov/Multimedia/VideoTours/Dulce/default.aspx>. Please call Dr. Cecilia Chao at (575) 759-3291 or (575) 759-7230; or e-mail cecilia.chao@ihs.gov if you have any questions. (4/13)

Hospitalist Gallup Indian Medical Center; Gallup, New Mexico

Gallup Indian Medical Center (GIMC) is currently seeking energetic and collegial internists for our new

hospitalist program. The hospitalists care for all adult inpatients previously taken care of by family medicine and internal medicine physicians, and provide consultation services. We have seven FTEs for hospitalists, and while we are still growing, we enjoy further inpatient staffing support from internal medicine and family medicine.

GIMC is a 99-bed hospital in Gallup, New Mexico, on the border of the Navajo Reservation. Clinical specialties at GIMC include internal medicine, family medicine, critical care, cardiology, neurology, orthopedics, ENT, radiology, OB/GYN, general surgery, ophthalmology, pathology, pediatrics, emergency medicine, and anesthesiology. The hospitalists' daily census is approximately 25 - 30. There is a six bed ICU. Our patient population includes Navajos, Zunis, and others living nearby, as well referrals from smaller clinics and hospitals.

Gallup has a diverse community and is very livable, offering a thriving art scene, excellent outdoor activities (biking, hiking, rock climbing, cross-country skiing), safe neighborhoods, diverse restaurants, national chains and local shops, and multiple public and parochial school options. The medical community is highly collegial, is committed to continuing education, has an on-going collaboration with Brigham and Women's Hospital, and has a high retention rate.

For more information, contact Eileen Barrett, MD, at (505) 722-1577 or e-mail eileen.barrett@ihs.gov. Or please consider faxing your CV to (505) 726-8557. (2/13)

Clinical Director, Family Medicine Physician Kodiak Area Native Association; Kodiak, Alaska

The Kodiak Area Native Association (KANA) is searching for an adventurous, highly motivated physician to lead our team that is committed to patient-centered care, customer service, quality improvement, and stewardship. KANA is celebrating its 47th year of providing patient and family focused health care and social services to Alaska Natives and other beneficiaries of KANA throughout Kodiak Island. KANA's award winning medical staff is comprised of four physicians who work in conjunction with two mid-level providers, dedicated nurse case managers, and ancillary staff to deliver the highest quality, team based health care to an active user population of 2800 patients. Integrated behavioral health and pharmacy services within the primary care setting also facilitate an advanced support system to ensure our patients' needs are met.

The spectacular scenic beauty of Kodiak Island offers a backdrop for an abundance of outdoor and family activities, including world-class fishing, hunting, wildlife viewing, kayaking, and hiking just minutes from your door. Its sometimes harsh climate is balanced by mild temperatures and

unparalleled wilderness splendor that provide Kodiak's residents with a unique lifestyle in a relaxed island paradise.

KANA offers competitive compensation and an excellent employee benefits package, including medical, dental, vision, flexible spending accounts, short term disability insurance, life insurance, accidental death and dismemberment insurance, 401k with employer contribution, fitness membership, and paid time off.

If you're interested in hearing more about how you can start your journey to an adventure of a lifetime, please visit our website at www.kanaweb.org, give Lindsey Howell, Human Resources Manager, a call at (907) 486-9880, or contact our HR Department at hr@kanaweb.org. Alaska's Emerald Isle awaits you! (2/13)

Pediatrician

Blackfeet Community Hospital; Browning, Montana

This hospital-based government practice is seeking a BC/BE pediatrician to work with another pediatrician and a pediatric nurse practitioner. Practice true primary care pediatrics with inpatient, outpatient, and newborn hospital care. Attractive call and rounding schedule. Competitive salary with federal government benefits. The area provides a wide variety of outdoor recreational activities, being only 12 miles from Glacier National Park. For more information, please contact Dr. Tom Herr at thomas.herr@ihs.gov or call (406) 338-6372. (1/13)

Director, Health and Human Services Ysleta Del Sur Pueblo; El Paso, Texas

The Ysleta Del Sur Pueblo (YDSP) Health and Human Services Department is a team of health care professionals and staff fully committed to their patients' physical, emotional, and spiritual wellbeing, offering a comprehensive range of health and human services that ensure a safe environment, quality service, and accessible health care in an atmosphere of respect, dignity, professionalism, and cultural sensitivity.

YDSP's HHS department is seeking a Director. This person has responsibility and accountability for the development and implementation of a plan to bring HHS to an ongoing operating success. The Director will need the flexibility to make quick and efficient business decisions, while at the same time assuring that operations respect the broad guidelines and, more importantly, the service standards expected by tribal members and tribal leadership. To get more information or to apply, contact Jason S. Booth, CEO, Ishpi, Inc., telephone (651) 308-1023; or e-mail jason@ishpi.biz. (1/13)

Family Medicine, Internal Medicine, Emergency Medicine Physicians

Sells Service Unit; Sells, Arizona

The Sells Service Unit (SSU) in southern Arizona is recruiting for board certified/board eligible emergency room/family physician to join our experienced medical staff.

The Sells Service Unit is the primary source of health care for approximately 24,000 people of the Tohono O'odham Nation. The service unit consists of a Joint Commission accredited 34-bed hospital in Sells, Arizona and three health centers: San Xavier Health Center, located in Tucson, Arizona, the Santa Rosa Health Center, located in Santa Rosa, Arizona, and the San Simon Health Center located in San Simon, Arizona with a combined caseload of approximately 100,000 outpatient visits annually. Clinical services include family medicine, pediatrics, internal medicine, prenatal and women's health care, dental, optometry, ophthalmology, podiatry, physical therapy, nutrition and dietetics, social work services, and diabetes self-management education.

Sixty miles east of the Sells Hospital by paved highway lies Tucson, Arizona's second largest metropolitan area, and home to nearly 750,000. Tucson, or "The Old Pueblo," is one of the oldest continuously inhabited sites in North America, steeped in a rich heritage of Indian and Spanish influence. It affords all of southern Arizona's limitless entertainment, recreation, shopping, and cultural opportunities. The area is a favored tourist and retirement center, boasting sunbelt attributes and low humidity, with effortless access to Old Mexico, pine forests, snow sports, and endless sightseeing opportunities . . . all within a setting of natural splendor.

We offer competitive salary, relocation/recruitment/retention allowance, federal employment benefits package, CME leave and allowance, and loan repayment. For more information, please contact Peter Ziegler, MD, SSU Clinical Director at (520) 295-2481 or by e-mail at Peter.Ziegler@ihs.gov. (12/12)

Family Physician with Obstetrics Skills Pediatrician (or Internal Med-Peds) Physician Ethel Lund Medical Center; Juneau, Alaska

The SEARHC Ethel Lund Medical Center in Juneau, Alaska is searching for a full-time family physician with obstetrics skills and a pediatrician (or internal medicine/pediatrics physician) to join a great medical staff of 14 providers (10 physicians, four midlevels) at a unique clinic and hospital setting. Have the best of both worlds by joining our practice where we share hospitalist duties one week every 6 - 8 weeks, and spend our remaining time in an outpatient clinic with great staff and excellent quality of life. We have the opportunity to practice full spectrum medicine with easy access to consultants when we need them. Maintain all your skills learned in residency and expand them further with support from our tertiary care center, Alaska Native Medical Center.

Clinic is focused on the Patient-Centered Medical Home, quality improvement with staff development from IHI, and adopting an EHR at the clinic and hospital in the near future. We have frequent CME and opportunities for growth, with teaching students and residents and faculty status at University of Washington available to qualified staff. This is a loan

repayment site for the Indian Health Service and National Health Service Corps.

Work in southeast Alaska with access to amazing winter and summer recreational activities. Live in the state capital with access to theater, concerts, annual musical festivals, and quick travel to other communities by ferry or plane. Consider joining a well-rounded medical staff of 14 providers at a beautiful clinic with excellent benefits. For more information contact, Dr. Cate Buley, Assistant Medical Director, Ethel Lund Medical Center, Juneau, Alaska; telephone (907) 364-4485, or e-mail cbuley@searhc.org. *Locum tenens* positions also available. (12/12)

Director
Center of American Indian and Minority Health
University of Minnesota Medical School;
Duluth, Minnesota

The University of Minnesota Medical School in Duluth, Minnesota, invites applications for a full-time Director for the Center of American Indian and Minority Health. The Center of American Indian and Minority Health (CAIMH) at the University of Minnesota Medical School strives to raise the health status of American Indian and Alaska Native people. This is achieved in part through programming and activities for American Indian students grade K - 16 and medical school, and partnerships with American Indian communities and organizations. The CAIMH, housed on the Duluth Campus, educates American Indian and Alaska Native students in the field of health care, and more specifically, in American Indian and Alaska Native health, and collaborates on research focused on improving the health of American Indian and Alaska Native people.

For more information about the Center of American Indian and Minority Health, go to <http://www.caimh.umn.edu>.

Required/Preferred Qualifications include an MD/DO degree; however, an alternative terminal degree may be considered in circumstances of exceptional fit. Previous employment experience in medical school. An academic background in a field relevant to medical education. All candidates must have evidence of essential verbal and written communication skills including clarity in the delivery of lectures and the writing of grants and other documents.

The Director position is a full-time time, 12-month appointment. Additional information is available online at <https://employment.umn.edu/> (Req. #182533). Review of applications will continue until the position is filled. The University of Minnesota is an Equal Opportunity Educator and Employer. Apply on-line at <https://employment.umn.edu/> Job Req # 182533. (12/12)

Clinical Director (Primary Care)
Family Medicine Physician
White Earth Health Center; Ogema, Minnesota

White Earth Health Center is located in northwestern

central Minnesota on the White Earth Reservation, which is in the heart of lake country. The reservation is 36 by 36 square miles; its largest metropolitan location is approximately 75 miles from Fargo, North Dakota or 235 miles from the Twin Cities. We have a satellite clinic in Naytahwaush (approximately 30 minutes from the WE Service unit) operating on Monday, Tuesday, and Friday, and one in Pine Point (approximately 30 minutes from the WE service unit) that is open on Thursday. The satellite clinics have one full time family practice physician and one family practice nurse practitioner who staff them on a regular basis.

We are a Federal Indian Health Service outpatient/ambulatory care facility that had 115,699 ambulatory visits for 19,494 registered patients this past year. We offer services Monday through Friday 8:00 am to 4:30 pm; on all federal holidays we are closed. Our services include a dental department with three full time dentists; a mental health department that consists of one psychologist, four counselors, one contract psychiatrist and one mental health nurse practitioner; and an optometry department comprised of the chief of optometry, one optometry technician/receptionist, and one contract optometrist.

Our medical staff consists of three full time family practice physicians, one contract family practice physician, one podiatrist, one internal medicine physician, one audiologist, a nutritionist, one pediatrician and three family nurse practitioners. We have pediatric and same day/urgent care clinics. The clinics are operating/implementing the IPC model.

We offer competitive salary, excellent benefits (health, life, retirement) and both sick and vacation leave. For further information, please contact Mr. Tony Buckanaga, Health Professions Recruiter at (218) 444-0486, or e-mail tony.buckanaga@ihs.gov. (11/12)

Registered Dietitian
Psychiatrist
Consolidated Tribal Health Project, Inc.;
Calpella, California



Consolidated Tribal Health Project, Inc. is a 501(c)(3) non-profit, ambulatory health clinic that has served rural Mendocino County since 1984. CTHP is governed by a board comprised of delegates from a consortium of nine area tribes, eight of which are federally recognized, and one that is not. Eight of the tribes are Pomo and one is Cahto. The campus is situated on a five-acre parcel owned by the corporation; it is not on tribal land.

CTHP has a Title V Compact, which gives the clinic self-governance over our Indian Health Service funding allocation. An application for any of these positions is located at www.cthp.org. Send resume and application to Karla Tuttle, HR Generalist, PO Box 387, Calpella, California 95418; fax (707) 485-7837; telephone (707) 485-5115 (ext. 5613). (11/12)

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**THE IHS PRIMARY
CARE PROVIDER**
A journal for health professionals working with American Indians and Alaska Natives

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