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The Development of Migrant-Specific Performance Measures

Candace Kugel, FNP, CNM, Director of Performance Improvement

If you are associated with a Migrant/ Community Health Center (M/CHC) funded by the Health Resources and Services Administration (HRSA), you may be developing some familiarity with the performance measures introduced in 2008 by the Bureau of Primary Health Care (BPHC). Grantees are now expected to report on a set of clinical and financial measures in an effort to collect data that will allow for the evaluation of individual and collective performance trends over time. The required measures are listed in Table 1.

BPHC encourages grantees that receive funding for special populations (migrant, homeless, public housing) to include supplemental measures in their health care plans that allow them to monitor the health status or outcomes of services for those populations. Likewise, many health centers that serve large migrant populations have expressed an interest in developing supplemental measures that effectively reflect the unique features of both the migrant population itself and the service delivery modalities used by Migrant Health Centers. The Migrant Clinicians (MNC) coordinated a work group to respond to this need and has recently completed a year-long effort which resulted in the development of a set of migrant-specific performance measures. The conclusions of that work are presented here.

The work group was made up of staff members of Migrant Health Centers and included representation from Eastern, Midwestern and Western locations; large and small health centers; voucher and non-voucher programs; and combined Migrant/Community Health Centers and "pure" Migrant Health Centers. (See "Migrant Measures Work Group Members, below)

The work group met by telephone and in person to discuss and develop two supplemental evidence-based migrant specific clinical performance measures and one financial measure. Background information was provided regarding the elements of sound performance measures and the current required measures. It was decided to focus on three categories of performance measures: **Enabling Services, Environmental/ Occupational Health (EOH), and Financial**. The process that was followed in developing the migrant-specific measures was as follows:

What's already out there?

Work group members shared measures already being implemented at their health centers. Notices were posted on list servers requesting that MHCs share measures currently in use related to enabling services, EOH issues, and migrant-specific financial measures. In addition, a wide variety of measures in use by other (non-migrant health) programs related to enabling services and EOH were gathered from sources such as the Association of Asian Pacific Community Health Organizations, Maternal Child Health Bureau, the Health Disparities Collaboratives and Healthy People 2010.

What's the evidence?

In order to create the most robust measures,

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Migrant Measures Work Group Members

- Joan Altenbernd, Migrant Health Services, Inc., Moorhead, MN
- Lorena Ayala-Lawless, United Health Centers, Parlier CA
- Susan Bauer, Community Health Partnerships of Illinois, Chicago IL
- Hilda Ochoa Bogue, National Center for Farmworker Health, Buda TX
- Elizabeth Freeman, NC Farmworker Health Program, Raleigh, NC
- Mitch Garcia, Valley-Wide Health Systems, Alamosa CO
- Barbara Ginley, ME Migrant Health Program, Augusta ME
- Mary Ellen O'Driscoll, CT River Valley Farmworker Health Program, Boston MA
- Nancy Pealing, Borrego Community Health Foundation, Borrego CA
- Claudia Stephens, MT Migrant and Seasonal Farmworker Council, Inc., Billings MT
- Bob Witt, Proteus Health Centers, Des Moines IA
- Mary Ann Zelazny, Finger Lakes Migrant Health Program, Pen Yan NY

Table 1: BPHC required performance measures

Clinical Measures

Quality of Care Indicators
- Trimester of entry into prenatal care
- Childhood (2 year old) immunization rate
- Pap tests for adult (21-64 year old) women

Health Outcomes and Disparities
- Infant birth weight (normal vs. low)
- Hypertension (controlled vs. uncontrolled)
- Diabetes (adequate control vs. inadequate control)

Additional
- Behavioral health measure of choice
- Oral health measure of choice

Financial Measures
- Total cost per patient
- Medical cost per medical encounter
- Change in net assets to expense ratio
- Working capital to monthly expense ratio
- Long term debt to equity ratio

See http://bphc.hrsa.gov/about/performancemeasures.htm for additional information about the required measures.

an effort was made to use outcomes that are supported by data and research. Studies related to enabling services were reviewed through resources available from Migrant Health Promotion (http://migranthealth.org/our_programs/programs_results/) and Health Outreach Partners (http://www.outreach-partners.org/peerresources.html). A review of literature of the effectiveness of EOH interventions also guided the selection of relevant measures.

What do our experts say?

Work group members, many of whom represented voucher programs, brought extensive expertise and experience to the project in the area of enabling services.

Two specialists in the area of Environmental and Occupational Health led the discussion of potential EOH measures: Amy Liebman, MA, MPA, Director of Environmental and Occupational Health with Migrant Clinicians Network, and Matthew Keifer, MD, MPH, a professor and Occupational and Environmental Medicine physician at the University of Washington School of Public Health and Yakima Valley Farm Worker Health Center.

Cynthia Prorock, a financial consultant for the Bureau of Primary Health Care with extensive expertise in fiscal issues related to 330 grantees led the discussion around the development of potential financial measures.

What is most relevant to migrant farmworkers and Migrant Health Centers?

After discussion of possible measures in each category, proposed measures were narrowed down to a menu consisting of three potential enabling services measures, three potential EOH measures and four potential financial measures. The menu was presented in an online survey format and work group members were asked to select the measures they thought would be most relevant and appropriate for MHCs for each category. Selected measures are as follows:

- **Preferred Enabling Services Measure:** *Percent of migrant patients ≥18 years of age with blood pressure ≥140/90 who are successfully referred for care.*

  This measure would monitor the effectiveness of enabling services by documenting the identification of patients outside of the clinic setting with uncontrolled hypertension who are entered into care. "Successfully referred" = referred and clinic visit documented.

  Calculation: Farmworker patients seen outside of the clinic setting with documented BP of ≥140/90 who are 1) referred for care and 2) are seen by a provider/Total farmworker patients seen outside of the clinic setting with documented BP of ≥140/90.
- **Additional Enabling Services Measures:**
  - *Percent of migrant women who have documented screening for sexual and intimate partner violence during the measurement year*
  - *Percent of migrant patients ≥12 years who have documented tobacco use status during the measurement year*
- **Preferred Environmental and Occupational Health Measure:** *Percent of registered farmworker patients who receive pesticide prevention education.*

  This measure would document how many farmworker patients receive education regarding the prevention of pesticide exposure, such as the use of personal protective equipment (PPE), proper storage and handling of pesticides, prevention of take-home exposure to family members, etc.

  Calculation: Farmworker patients with documented pesticide prevention education/Total registered farmworker patients.
- **Additional Environmental and Occupational Health Measures:**
  - *Percent of registered farmworker patients screened for Environmental/Occupational Health (EOH) risk*
  - *Percent of registered farmworker patients who receive eye protection education*
- **Preferred Financial Measure:** *Average cost per patient for enabling services.*

  This cost measure would provide a basis to value each enabling service individually and/or in total, allowing each grantee to determine the baseline, trends, and goals for their program. Increases in service levels per patient may result in increased "average cost per patient", while increases in the total number of patients served within the same staffing and cost structure will result in lower "average cost per patient" indicating improved efficiency.

  Calculation: Total Cost for Enabling Services / Unduplicated Enabling Patient (or – Average Hours per Patient X Average Cost per Hour)
- **Additional Financial Measures:**
  - *Average Cost per Hour for Enabling Services*
  - *Overhead Rate – Administration and Facilities*
  - *Average Hours per Patient for Enabling Services*

Will they work?

Candace Kugel, MCN Director of Performance Improvement, and Amy Liebman, Director of Environmental & Occupational Health, conducted a two-day site visit in September to the North Carolina Farmworker Health Program (NCFHP) to perform a pilot implementation of the selected measures. Working with the organization's leadership, the group walked through the mechanics of implementing each of the three preferred measures. NCFHP planned to submit a BPR application and planned to incorporate the measures into their business and health care plans. The process helped to identify and clarify processes and tools needed for implementation of the measures.

Participants in the Migrant Measures Project from the North Carolina Farmworker Health Program, Raleigh NC. From left to right: Elizabeth Freeman Lambar, MSW, MPH, Program Director; Melissa Miles, MPH, Program Manager; and Sylvia Becker-Dreps, MD, MPH, (former) Medical Director

Future steps

The migrant-specific performance measures discussed in this article are not meant to replace the BPHC required core measures, and will not be required for MHCs. They are intended only as suggested supplemental measures for MHCs.

Dissemination of information related to the development and use of these migrant-specific performance measures is underway. The outcomes of the work group have been presented to the National Advisory Council on Migrant Health and to BPHC leadership. A national webcast and conference presentations are being planned. For specific questions, please contact Candace Kugel at *ckugel@migrantclinician.org*. ■

Building Infrastructure in Guatemala through Community-Academic Partnerships

Jaime Marshburn, BSN and Kim Larson, RN, PhD, MPH

North Carolina is home to an increasing number of Latino immigrants and families from Guatemala, particularly, are settling in rural eastern North Carolina where employment in poultry and pork processing is available (North Carolina Office of State Budget and Management, 2003; United States Census Bureau, 2000). Many health care providers in North Carolina are relatively unfamiliar with the health beliefs and practices of Guatemalans. To provide quality and safe health care, clinicians would benefit from a better understanding of the health needs of this population.

Guatemala is most famous for the indigenous Mayan Indian culture, the largest ethnic group (60%) in the country. A 30 year civil war left many rural villages with limited access to health and social services. In 2006, Guatemala had an infant mortality rate of 31/1000 live births, a rate higher than neighboring Mexico (29/1000), Belize (14/1000), Honduras (23/1000), and El Salvador (22/1000) (World Health Organization [WHO], 2008). In addition, Guatemala has an under-five mortality rate (U5MR) of 41/1000 live births and a maternal mortality rate of 290/100,000 compared to Mexico's U5MR of 28/1000 and maternal mortality rate of 83/100,000 (WHO, 2008). These health indicators shed light on the critical health disparities facing Guatemalans.

Since 2008, East Carolina University (ECU) College of Nursing has partnered with *La Union Centro Linguistico*, a respected Guatemalan cultural training center, to lead an international community health nursing course. The goal of the course was to: a) establish a partnership between ECU College of Nursing and an indigenous Mayan community to ensure on-going community health outreach projects and 2) sensitize future nurses to the cultural ways and needs of one of the many Latino populations living in the U.S. During the international cultural immersion experience, students live with Guatemalan families in rural villages and travel by the local *camioneta* (old school bus) daily into Antigua for Spanish language lessons. Specific community service learning projects were identified and implemented by *La Union*, ECU students, and village leaders. Initial projects targeted oral health, nutrition, and sanitation. The information was delivered to children and adults through popular education format of interactive games, songs, and role play (Werner & Bower, 1978). A total of 26 nursing and pre-medical students participated in the course between 2008 and 2009. The course benefits students by allowing

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them to learn a second language, acquire an understanding of the Mayan culture and health care delivery systems, and develop partnerships with village leaders through community service learning projects. Guatemalans benefit through the community service learning projects that are designed to mitigate adverse community health outcomes. This paper reports on one community service learning project that was designed to provide a foundation for sustainable infrastructure development.

Methods

In 2009, *La Union-ECU* partnership conducted a community health assessment that sought to elicit the opinions of Guatemalan residents in five rural villages. A Spanish-English community health assessment tool (available at *www.migrantcliniciansnetwork.org*) used with Latinos in rural eastern North Carolina was adopted for use in Guatemala. Over the course of one week representatives from *La Union* and ECU College of Nursing traveled to five rural villages to request the participation of community members in the survey. Staff members at *La Union* were familiar with these villages and assisted in establishing rapport and building trust. A consent form was read in Spanish to participants and verbal consent was given. The research study was approved by the University Medical Center Institutional Review Board (UMCIRB).

Survey questions were read in Spanish to participants and responses were recorded as either “a problem/concern” or “not a problem/concern.” Participants were asked their opinion of a list of 21 community health concerns, 11 adult health concerns, and 19 environmental and social concerns. Participants were also asked to identify any additional health concerns not on the survey. A total of 19 Guatemalan men (n=3) and women (n=16) from varying socioeconomic backgrounds participated in the survey.

Findings

The three categories assessed were community health (all ages), adult health, and environmental and social concerns.

Community Health

The top three community health needs identified were pneumonia and influenza, diabetes, and teen-age pregnancy. Eighty-nine percent (n=17) of participants reported that pneumonia and influenza were major problems in their community. Both diabetes and teen-age pregnancy were identified as community health concerns by seventy-four percent (n=14) of participants.

Adult Health

The top three adult health concerns were lack of regular health care, difficulty handling stress, and alcohol abuse. Seventy-nine percent (n=15) of participants believed that adults had a problem receiving regular health exams. Seventy-four percent (n=14) of participants responded that adults in their community had difficulty handling stress. Alcohol abuse was identified as a problem among adults in these communities by sixty-eight percent (n=13) of participants.

Environmental and Social Concerns

The top three environmental or social concerns were emergency preparedness, affordable housing, and job opportunities. Both emergency preparedness and affordable housing were reported as a problem by eighty-nine percent (n=17) of participants. Seventy-nine percent (n=15) of participants reported a problem with job opportunities.

Discussion

Concerns identified through this community health assessment are linked to the human and social infrastructure of these rural communities. Interventions that might address these concerns fell into the categories of: a) primary and secondary prevention and b) primary health care.

Primary and Secondary Prevention

In the summer of 2009, the H1N1 epidemic had brought a heightened awareness of influenza even to rural Guatemalan villages. At the time, vaccines were still being developed and, like the US, Guatemala was relying on primary prevention strategies in the form of written brochures and posters with pictures of correct hand-washing and coughing procedures. Not surprising, the most popular community service learning project implemented by ECU students was demonstration of hand-washing and “elbow” coughing. Local leaders invited the health professional students into numerous local schools to use songs and games with children to convey the importance of hand-washing to prevent the spread of germs.

Diabetes mellitus constitutes the greatest burden of mortality for Latinos in the United States (Vega, Rodriguez, & Gruksin, 2009). Developing countries typically focus their limited resources on the prevention of infectious diseases, yet chronic diseases, such as diabetes, may be creeping into rural communities with little public health attention. Food insecurity that was thought to result in an undernourished population may actually result in over-consumption of less expensive, high carbohydrate foods, such as rice and bread. Limited information was available in rural communities on the prevention and early detection of diabetes. Glucose screening was not a routine practice in the *Centro de Salud*, the Health Center, serving these rural communities.

In the U.S. the highest pregnancy rates for adolescents aged 15-19 are among Latina adolescents, a fact of major public health concern (Centers for Disease Control and Prevention [CDC], 2009). Teen-age pregnancy, which is influenced by community-level cultural and gender norms, was also seen as a community health concern in Guatemala. Many adverse health and social outcomes result in early, unintended pregnancies, including the high infant and maternal mortality rates found in Guatemala.

Guatemala is a country that has experienced mass destruction from natural disasters, such as volcanic eruptions and earthquakes. An earthquake occurred in neighboring Honduras during the summer of 2009, which may have influenced responses on this survey. Still, emergency preparedness is a real community health threat to Guatemalans. Housing materials are scarce and costly and the remoteness of villages and limited community resources all affect disaster preparedness.

La Union-ECU partnership, along with local leaders, could plan and implement primary and secondary prevention strategies to address these community and environmental concerns. Strategies could include vaccination campaigns, diabetes screening programs, and community-wide education forums. The ECU Center for National Hazards Research could assist local leaders with training on natural disasters and emergency preparedness. Faculty and students in the Schools of Business, Engineering, and Education could assist local leaders with the development of small business enterprises, housing projects, job training and educational classes for community members. Faculty and students in social work and health behavior and education could partner with local leaders to organize and train community health workers on primary prevention of early, unintended pregnancy and substance abuse.

Primary Health Care

While some villages have a *Centro de Salud*, not all villages have access to these health centers. Furthermore, many people wait hours to be seen and only use the *Centro de Salud* when someone is sick or in an emergency. Preventive practices, such as routine physical examinations are not yet a part of the health care delivery system in rural

Guatemala. In addition, transportation and ability to pay might be barriers to seeking health care.

The Academic Health Center at ECU includes the School of Dentistry, Brody School of Medicine (which houses the Department of Public Health), College of Nursing, and College of Allied Health Science. Faculty and students in these schools and colleges are in a position to partner with Guatemalan health officials to supplement and expand primary health care programs and services through rural outreach clinics in Guatemala.

Conclusion

An international partnership that involves Guatemalan leaders and U.S. academic partners can begin to address some of the human and social infrastructure concerns of rural Guatemala. A long-term commitment toward sustainable infrastructure development from all partners is an essential component to this solution. *La Union Centro Linguistico* is a vital part of the international partnership that can support efforts of cross-cultural language acquisition and cultural sensitivity in developing trusting relationships with rural Guatemalan communities. Effectively addressing the issues identified through this community health assessment will require the collaboration of various disciplines at ECU to provide culturally tailored interventions. Based on this health assessment, one initiative in progress is a partnership between ECU public health students, *La Union*, and Guatemalan leaders to develop a disaster preparedness plan beginning in the summer of 2010.

International cultural immersion programs with a rigorous academic community service learning component should include language training and cultural sensitivity with the goal of sustainable infrastructure development. Ultimately, by preparing health professionals through international cultural immersion programs, the course seeks to ensure safe and quality health care for one of the many Latino populations living in North Carolina. Community-academic partnerships, like the one between *La Union* and ECU, can contribute to the economy of the country and improve health care delivery and health status outcomes of the most vulnerable populations.

Contact the authors at: 3132 Health Sciences Building, College of Nursing, East Carolina University, Greenville, NC, 252-744-6527 (O), 252-744-6387 (Fax), larsonk@ecu.edu ■

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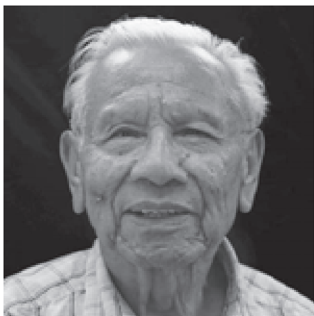

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A Model for Training Clinicians for Community Health Centers

Barbara Hollinger, FNP

According to the National Association of Community Health Centers (NACHC) "ACCESS for All America Plan" to reduce the ranks of America's medically disenfranchised, community health centers must be preserved, strengthened and expanded to reach a total of 30 million patients by the year 2015.(1) According to the NACHC report community "health centers currently need 1,843 primary care providers, inclusive of physicians, nurse practitioners, physician assistants and certified nurse midwives". The report also concludes that to "reach 30 million patients by 2015, health centers need at least an additional 15, 585 primary care providers, just over one third of whom are non-physician primary care providers".[1]

The Family Nurse Practitioner Program at University of California, San Francisco (UCSF), is preparing ideal candidates to meet this need and is a modal for other Schools of Nursing in this endeavor. Of UCSF FNP students graduating with the Master of Science degree between 2006-2008 68% are practicing in California with underserved populations. That figure does not include the many graduates working with underserved rural populations in other states such as Alaska, Arizona, New Mexico, Louisiana and New Hampshire. Seventy percent of these new clinicians are fluent in a second language related to population services with most of them speaking Spanish. The current two classes have 71 and 74% fluency in a qualifying language. Diversity recruitment and support are major goals of the UCSF School of Nursing as reflected in the Teaching Mission Statement to "Prepare students from culturally diverse backgrounds to assume leadership roles in nursing clinical practice, administration, teaching and research". Of the sixty-six 2006-2008 graduates 39% were under represented minority students.

These successes begin with student recruitment. Among our many qualified applicants preference is given to those who state their desire to work with underserved populations and who have demonstrated this through work or volunteer experience. Extra credit is given to applicants who speak languages needed to work with underrepresented populations. Many of the native speakers are members of these underrepresented groups.

Since Spanish is such an important language in caring for the California population UCSF offers many opportunities to enhance Spanish language skills. Originally purchased with grant money, Pimsleur Spanish language CDs or tapes are available for rental with 3 proficiency levels of 30 lessons each. Class credit is available for 3 Spanish language classes that include cultural content. An innovative course specific to prenatal care requires the student to view a video of faculty interviewing a pregnant patient on a series of pregnancy related topics. The students then record themselves doing the same interview with a fellow student. The instructor gives students feedback on their recorded interview.

Students have required course work specific to working with underserved populations. Care of High Risk Populations I and II introduces concepts of health care disparities, epidemiology of health conditions and focuses on managing conditions common in high risk populations. Primary Care of High-Risk & Vulnerable Elders uses case studies of ethnically diverse clients with complex medical issues developed by medical anthropologists and geriatricians.

An elective 20 hour course taken by many NP and occupational health students is Primary Farmworker Health Care. Topics include cultural content, common health complaints of migrant and seasonal farmworkers, women and children's issues, pesticide exposures, immigration and welfare concerns and mental health. The final assignment is to either interview a farmworker or farmworker family member or to visit a farmworker clinic.

The other crucial component of student preparation is the clinical residency. All FNP students complete a minimum of 560 hours of supervised direct patient care that covers OB/GYN, pediatrics and general family medicine. All students complete one or more clinical residencies working with underserved populations. These range from urban county clinics to jails or community health centers. Many sites require students to be fluent in Spanish. Community health centers are ideal placement sites in that they more often reflect a true family practice model with all age groups seen within the context of the family. In more urban settings pediatrics and women's health or obstetrics are often viewed as a specialty and seen outside of the family practice.

During the academic year clinical rotations at each site are once weekly for 4 to 8 hours over ten weeks. Despite having students travel to clinical sites all over the greater San Francisco Bay Area, UCSF is still mostly an urban program. Recognizing the need to encourage students to consider the needs of rural communities the FNP program has developed a number of rural sites where students do focused clinical rotations of 40-80 hours over 1-2 weeks. To date we have placed students in three California sites in Anderson Valley, Squaw Valley in the foothills above Fresno, Salinas and Roseburg, Oregon. Student comments have strongly endorsed the value of the rural experience. One student expressed how her Salinas experience, "solidified my skills", "improved time management by ramping up the number of patients expected to see in a busy setting" and overall was "more effective learning". Another student noted that "staying in the community was invaluable and helped solidify my desire to work in a rural community setting." Both of these graduates are now employed in settings that provide primary care to farmworker populations and set an example for current students considering rural community health center as an option after graduation.

The UCSF FNP Program would like to expand the number of rural training sites. Such arrangements are beneficial for both the university and the community health centers. For rural community clinics seeking to hire nurse practitioners it provides an opportunity to support the training of a clinician that could become an employee. It allows the health center to determine if this clinician would be a good fit for the needs of that particular health center. Although this article highlights the UCSF FNP Program, nursing schools across the country are looking for clinical training sites for nurse practitioner students and would welcome community health center – university collaboration.

For community health centers interested in collaboration with UCSF School of Nursing a Training Affiliation Agreement must be signed prior to student placement. A clinical "preceptor" to supervise the student on site needs to be identified and housing arranged. For further information feel free to contact Barbara Hollinger at: *Barbara.Hollinger@nursing.ucsf.edu* ■

1. National Association of Community Health Centers (2008) "What is ACCESS for all America" downloaded from website 2/2/10

Aches, Pains, and Strains

How to avoid musculoskeletal disorders

Helen Murphy, RN, Director of Outreach and Education, University of Washington Pacific Northwest Agricultural Health and Safety Center

Musculoskeletal disorders are physical conditions affecting muscles, tendons, nerves, and joints that are not due to acute trauma, such as falling from a ladder. Musculoskeletal disorders are the leading cause of disability among workers. Between 1997 and 2005, they cost the agriculture industry $136 million and 862,500 lost workdays.

Types of injuries

Neck: While neck disorders are relatively uncommon, they are the second most costly type of musculoskeletal disorder, averaging $15,813 per claim and require the most time away from work to recuperate (279 days on average).

Back: Back disorders are more common but less costly (averaging $11,626 per case) and require the least time away from work (195 days). However, if the problem involves a pinched nerve, called sciatica, it is very expensive ($69,237 per case) and results in 554 lost workdays on average.

Upper extremity: Most of these claims involve the hand and wrist, followed by the shoulder and elbow.

Carpal tunnel syndrome and tendonitis (tenosynovitis) both result from repetitive motion of the hand and wrist. The average cost of carpal tunnel syndrome is $21,208 per claim, with an average of 250 workdays lost. While tendonitis is less expensive, time loss is comparable.

Shoulder problems, specifically the very debilitating **rotator cuff syndrome**, are the most expensive in terms of costs and time off work. Average time lost is almost a year (323 days), and the cost averages $29,877 per claim. Excessive force, repeated elevation, or forward flexion of the arm are the activities most likely to cause this syndrome.

Epicondylitis is the least common and least costly ($11,382) of the upper extremity work-related problems, but the recovery time is long, averaging 263 days. It is a slow-healing inflammation of the forearm tendon, which attaches to the elbow. Forceful and repetitive gripping and overuse of the forearm during tasks such as pruning can lead to this problem.

Causes of musculoskeletal disorders

Physical stress on the body's muscles, tendons, nerves, and joints are the root causes of work-related musculoskeletal disorders. It is not merely how much force, but how long the body part is under stress or how often that matters. While much has been automated in agriculture, manual labor is still required in order to produce a quality product. This may involve chronic exposure to physical stresses that lead to musculoskeletal disorders, such as:

- Working for prolonged periods in a stooped position
- Carrying heavy loads in awkward positions
- Working with hands, arms, or elbows above shoulder level
- Kneeling or squatting
- Repetitive forceful gripping
- Subjecting the whole body to continuous vibration

Preventing these injuries takes study and imagination. The study aspect comes through the science of ergonomics, which assesses a worker's physical capabilities in relationship to the tasks, tools, and environment of the specific job. An ergonomic demonstration project conducted in 2000 in the tree fruit industry documented which tasks are risky and should prompt either employee ergonomic awareness training (caution zones) or workplace changes (hazard zones). The project identified instances of awkward hand and arm positions, awkward neck and back postures, highly repetitive motion, and heavy and frequent lifting in a number of common tasks.

Solutions

Dealing with these ergonomic risks is where the creativity comes in. It often requires redesigning the tools or a rethinking how the work is conducted. This will help reach the ultimate goal of improving workers' posture, reducing the physical force required for the task, and limiting exposure to repetitive motions. Here are some tips:

- Avoid locating hand tasks or tools above shoulder height. Tools should be within 16 inches of the worker.
- Provide seating if possible because standing causes pooling of the blood and swelling in the legs (more than when walking), which increases the risk of fainting in hot weather.
- Provide a floor mat for workers who are required to stand, and be sure their work table is the proper height. For men conducting light work it should be 43 to 43 inches high, and for heavy work, 36 to 39 inches. For women, the height should be 37 to 39 inches for light work and 33 to 35 inches for heavy work.

- The diameter of tool handles should allow the worker to grip all around the handle with the thumb and fingers overlapping by 3/8 inch.
- To limit the stooping, provide workers with long handled tools.
- Pruning tools should have handles that are long enough so as to not press into the palm. A spring to keep them in an open position reduces the fatigue associated with prying them back open after each cut. They also need to be covered with rubber or plastic.
- Provide handles for all loads that workers need to lift, and limit the weight of boxes to no more than 50 pounds.
- Give workers the following advice about lifting:
  - Position loads between hands to shoulder level. Avoid lifts from the floor and higher than the shoulder.
  - Keep the load as close to your body as possible throughout the entire lift.
  - Get a good grip and balance the load.
  - Never twist while lifting. Turn feet so that they point in same direction as your lift while you turn.
  - Avoid carrying a heavy load more than ten feet without getting help or mechanical assistance.
  - If you cannot fit the load between your bent knees, lift with a bent back and hips, keeping your knees relaxed. Being close to the load is more important than bending your knees. ■

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Houston, TX
www.osha.gov

2010 National Farmworker Health Conference
May 5-7, 2010
San Diego, CA
www.nachc.com

Cancer, Culture & Literacy Conference
May 20-22, 2010
Clearwater Beach, FL
http://www.moffitt.org/ccl

National Summit of Clinicians for Healthcare Justice
September 23-25, 2010
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