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Critical Review

Racial and Ethnic Disparities in Pain: Causes and Consequences of Unequal Care

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Abstract: The purpose of our review is to evaluate critically the recent literature on racial and ethnic disparities in pain and to determine how far we have come toward reducing and eliminating disparities in pain. We examined peer-reviewed research articles published between 1990 and early 2009 that focused on racial and ethnic disparities in pain in the United States. The databases used were PubMed, Medline, Scopus, CINAHL, and PsycInfo. The probable causes of minority group disparities in pain are discussed, along with suggested strategies for eliminating pain-related disparities. This review reveals the persistence of racial and ethnic disparities in acute, chronic, cancer, and palliative pain care across the lifespan and treatment settings, with minorities receiving lesser quality pain care than non-Hispanic whites. Although health and health care disparities attract local, state, and federal attention, disparities in pain care continue to be missing from publicized public health agendas and health care reform plans. Ensuring optimal pain care for all is critically important from a public health and policy perspective. A robust research program on disparities in pain is needed, and the results must be successfully translated into practices and policies specifically designed to reduce and eliminate disparities in care.

Perspective: This review evaluates the recent literature on racial and ethnic disparities in pain and pain treatment. Racial and ethnic disparities in acute pain, chronic cancer pain, and palliative pain care continue to persist. Rigorous research is needed to develop interventions, practices, and policies for eliminating disparities in pain.

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Key words: Minority, race, ethnicity, disparities, pain, review literature.

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The United States of America is a racially and ethnically diverse country with non-Caucasian minority groups now comprising roughly one third of the US population. Moreover, by the year 2042, minorities

are expected to become the majority. In 2050, the United States is projected to be 54% minority, yielding a multi-ethnic, multiracial, and multilingual society.¹⁷³ The richness derived from the people, cultures, and languages results in both the strength and greatness that is the United States. Although the United States was founded by people from many different countries and built on principles of justice and equality for all, minority groups have often suffered inequities and injustice in multiple areas (eg, housing, employment, criminal justice). More specifically, health and health care provide important examples of injustices, unequal burdens, and unequal care that are at least partly the legacy of racial segregation extending into the health care system.^{15,188}

The National Institutes of Health (NIH) defines health disparities as "differences in the incidence, prevalence,

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mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States.²⁸ A growing literature documents racial and ethnic disparities related to pain. Disparities are noted in pain epidemiology, access to quality pain care, pain assessment and treatments, and pain-related outcomes.^{34,44,69} In 2002, the Institute of Medicine (IOM) of the National Academy of Sciences published "Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care." Disparities were defined as "racial and ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention."¹⁶¹ The report concluded that racial and ethnic disparities are pervasive in our health care system. Consistent with the previous report, another IOM report, "The Unequal Burden of Cancer," described racial disparities.⁸¹ Although briefly discussed, pain management for acute and cancer-related pain was named as one area where marked disparities exist. Overall, these disparities in pain assessment and treatment exist for all types of pain (acute, chronic, and cancer) across the life span.

Many federal agencies (eg, NIH, Agency for Healthcare Research and Quality, AHRQ) and the US Congress have acknowledged disparities and included the reduction and elimination of health and health care disparities in their strategic plan. In fact, in 1999 the Secretary's Council on Health Promotion and Disease Prevention Objectives in the US Department of Health and Human Services established goals for improving the health of all Americans by 2010.^{100,174} Recognizing the urgent need to reduce health care disparities, the Council named one goal as the elimination of disparities in health status among racial and ethnic populations in the United States.

Several reviews have focused on the growing literature on race, ethnicity, and pain treatment.^{15,34,44,51,69} The purpose of this review is to evaluate critically the recent literature on racial and ethnic disparities in pain and to determine how far we have come toward reducing and eliminating disparities in pain. The research on probable causes of minority group disparities in pain will be discussed, along with suggested strategies for eliminating pain-related disparities among racial and ethnic minorities. Recommendations for future research also will be presented.

Peer-reviewed research articles published between 1990 and early 2009 that focused on racial and ethnic disparities in pain in the United States were examined. The databases were PubMed, Medline, Scopus, CINAHL, and PsycInfo. The key words used for the search included pain, pain management, minority, ethnicity, race, disparities, culture, African American, Black, Hispanic, Latino, Native American, Asian American, medically underserved, and palliative care. The articles were categorized according to the type of pain or pain-related issue (eg, barriers to pain treatment).

Definitions of Race and Ethnicity

Many definitions of race and ethnicity have been proposed, but there is no consensus as to the best or most

appropriate ones. The literature on disparities in pain is complicated by the terms race and ethnicity that are often used interchangeably and without proposed definitions.¹³¹ Race is a complex, multifaceted term with different conceptualizations.^{31,187} Some investigators have defined race primarily by ancestry and combinations of physical characteristics. Others claim race is largely a social or sociopolitical construct that includes self-identity and culture.^{16,57,187,189,190}

The NIH has adopted the 1997 Office of Management and Budget (OMB) revised minimum standards for maintaining, collecting, and presenting data on race and ethnicity.^{128,187} The 5 racial categories are American Indian or Alaskan Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white. The NIH has stated the racial categories should be considered sociopolitical constructs and not biological ones.^{121,187} Many investigators also characterize samples with other labels (eg, European Americans).

Ethnicity as a social construct refers to a designated group of people within a society.⁸⁷ The term ethnicity defines groups of people on the basis of characteristics such as shared culture, language, beliefs, behaviors, history, and experience. The OMB standards include 2 ethnic groups: Hispanic or Latino and not Hispanic or Latino. Unfortunately, ethnic and racial categories are not always described adequately in the disparities literature. For example, non-Hispanic white describes a subject's race and ethnicity using the OMB categories. Hispanic, however, describes a subject's ethnicity but not his or her race.

"Minority" is another term frequently used in the pain disparities literature. The NIH defines a minority group as a readily identifiable subset of the US population, distinguished by racial, ethnic, and/or cultural heritage.^{121,187} Other definitions of minority add that minority groups typically have suffered discrimination in society.⁵⁷ The minority categories used by the NIH are the racial and ethnic groups described previously. The NIH definition, however, does not specify the majority group or address the heterogeneity within each minority category. In this review, we used the NIH racial and ethnic categories unless other categories or definitions were used in specific studies.

Acute Pain

Emergency Medicine

During the past 15 years, multiple studies in the emergency department showed minority patients are at risk for undertreatment of acute pain. In an early investigation, Todd and colleagues¹⁷¹ conducted a retrospective review of patients receiving analgesics for isolated long-bone fractures. Hispanic patients (55%) were twice as likely as non-Hispanic white patients (26%) to receive no analgesics at all. These differences persisted even after controlling for gender, primary language, insurance status, severity of injury, and substance abuse. A subsequent study by Todd and colleagues found that black patients were also at risk for inadequate analgesia in the

Anderson, Green, and Payne

emergency department.¹⁶⁹ Black patients with long-bone fractures were 66% more likely to receive no analgesics than were white patients. This disparity was found even though black patients were as likely as white patients to have notations regarding pain in their charts. Another study of patients with extremity trauma found that physician ability to assess pain severity did not differ for Hispanic and non-Hispanic white patients.¹⁷⁰

Subsequent studies did not find disparities in analgesia for conditions treated in the emergency department,^{13,14,32,99,117,122,178} whereas other investigations continued to document disparities related to minority group status.^{82,86,166} For example, Fuentes and colleagues,⁶⁰ in a retrospective study of emergency room patients in the San Francisco area, found that black, white, Asian, and Latino patients were equally likely to receive analgesia for pain associated with extremity fractures. In fact, most patients (>80%) received some type of analgesic. In one of the few prospective studies of analgesia in the emergency department, a convenience sample of 91 minority and nonminority adult patients with nontraumatic low back pain was evaluated. Physician estimates of the patient's pain severity was the only factor associated with a prescription for analgesics.⁹

Several studies completed secondary database analyses of the National Hospital Ambulatory Medical Care Survey (NHAMCS) data. Several investigations demonstrated significant racial or ethnic disparities in analgesic prescribing in the emergency room for specific conditions and time periods,^{82,86,166} whereas other studies found no differences.^{64,137,159,194} For example, an examination of analgesic prescriptions among a nationally representative sample of more than 60,000 patients in the 1997-1999 NHAMCS found that white, African American, and Latino patients were equally likely to receive some form of analgesia.¹⁶⁶ African American patients, however, were less likely to receive opioid analgesics for diagnoses of back pain and migraine headaches.

An analysis of the pediatric patient data in the NHAMCS from 1992 to 1997 revealed racial and ethnic differences in parenteral analgesics and sedative agents.⁸⁶ Among patients with long-bone fractures, African American children covered by Medicaid insurance were the least likely to receive parenteral analgesics or sedatives. A subsequent study of the NHAMCS database evaluating all types of analgesic use found that African American and Latino children age 18 or younger were as likely as white children to receive analgesia for long-bone fractures.¹⁹⁴

The discrepancies and negative findings across studies may be related to variability in study methodologies, sample size, patient populations, and geographic locations. Most studies were retrospective database or chart reviews. The negative findings also suggest increasing public and professional awareness of inadequate pain management may have led to improvements in pain assessment and treatment in the emergency department.¹⁵⁸ More specifically, the standards for assessing and treating pain developed by the Joint Commission on Accreditation of Healthcare Organizations and the Veterans Health Administration, as well as educational

programs sponsored by the Academy of Emergency Medicine, may have facilitated some recent improvements in pain management in emergency medicine.⁷⁸

A recent comprehensive review of NHAMCS data from 1993 to 2005 found data supporting recent improvements in assessing and treating pain in the emergency department. During this 13-year period, pain-related problems accounted for 42% of emergency room visits.¹³⁴ Opioid analgesic prescribing for pain-related visits increased from 23% in 1993 to 37% in 2005; however, white patients with pain were significantly more likely to receive an opioid analgesic than black, Hispanic, or Asian/other patients. These disparities did not change significantly over time and were evident for children as well as adults. In 2005, opioid analgesics were prescribed for 40% of white patients reporting pain but only 32% of nonwhite patients reporting pain.

Overall, studies on analgesia in the emergency department indicate persistent and significant racial and ethnic disparities in providing adequate analgesics. Nonetheless, prospective studies with adequate sample sizes are needed to investigate factors that contribute to pain disparities in emergency medicine. Multicenter studies with broad geographic and ethnic representation in diverse types of emergency medicine settings would be helpful.⁶⁹ It also would be beneficial to examine process variables in addition to analgesic prescribing (eg, referrals, diagnostic tests for evaluating pain-related conditions).

Postoperative Pain

In the past 15 years, multiple studies have evaluated racial and ethnic disparities in the treatment of postoperative pain. One of the first studies examined a retrospective cohort of patients who underwent uncomplicated appendectomies.¹¹¹ White patients received significantly higher total postoperative opioid doses as compared with minority (Asian American, black, Hispanic) patients. Two studies of postoperative use of patient-controlled analgesia (PCA) found differing results. A retrospective cohort study of more than 400 patients treated with PCA found significant differences in the amount of PCA patients were prescribed,¹²⁴ with whites prescribed a higher dose of opioids than the Hispanics, and the blacks prescribed a higher opioid dose than both Hispanics and Asian Americans. In contrast, subjective pain scores, expectations for pain relief, and knowledge of PCA reported by patients did not differ significantly by minority group. However, the sample size for minorities was relatively small. In addition, patient body mass, a variable potentially influencing PCA requirement, was not controlled in the analyses. A recent PCA study comparing 30 white and 30 Hispanic patients receiving postoperative PCA¹ revealed no significant differences in the amounts of morphine prescribed by physicians or self-administered.

A retrospective cohort study analyzed the pain management of 250 patients hospitalized for open reduction and internal fixation of limb fractures.¹²⁵ Although there were no differences among racial or ethnic groups in nonopioid analgesics, white patients received

significantly higher doses of opioid analgesics than did black and Hispanic patients. This racial and ethnic disparity persisted after controlling for operative time, comorbidities, number of procedures, length of hospital stay, and insurance status.

A secondary data analysis from 4 studies evaluated possible disparities in pain management among a total sample of 964 hospitalized adults with postoperative, cancer or chronic illness-related pain.¹¹³ Minority group patients (African American, Hispanic, "other") reported more severe pain, pain-related interference, and were more likely than white patients to be prescribed analgesics that were not adequate, given their pain intensity.

A study of women who underwent surgery for breast cancer found African American and Latina women had greater postsurgical pain and related symptoms than did white women.⁵⁰ In a study of labor and delivery, Rust¹⁵³ found that black, Hispanic, and Asian women were less likely to receive epidural analgesia than white women. Minority group remained the strongest predictor of epidural use after controlling for possible confounding variables such as age and availability of anesthesiologists. Prospective studies with adequate sample sizes of postoperative patients are needed to further evaluate disparities and to identify possible mechanisms and solutions.

Chronic Noncancer Pain

Retrospective studies evaluating a mixed chronic pain population revealed increased pain severity for blacks when compared with whites across the lifespan, regardless of gender.^{71,110} Important differences were found in health among blacks and whites with chronic pain, with blacks reporting significantly more disability, more symptoms consistent with depression and post-traumatic stress disorder (PTSD), and more suffering and less control over pain than whites across the age continuum regardless of gender.^{69,71,72} Because racial and ethnic minorities are often more reluctant to seek treatment for mental health disorders than whites, they may also have more negative sequelae such as psychological morbidity, impaired social functioning, and increased physical disability due to chronic pain.^{71,72}

Important race-related variability in pain symptom severity, emotional reactions to pain, and disability also were revealed in a sample of 264 patients receiving treatment for chronic pain, with blacks having an increased disease burden as compared with whites.¹¹⁰ Other studies of African American and white patients seen in multidisciplinary pain centers have found that the minority patients reported increased pain severity⁴⁵ or pain unpleasantness¹⁵⁰ as compared with white patients. In a study using cluster analysis to identify subgroups of chronic pain patients (ie, chronic pain syndrome, good pain control, and disability with mild pain syndrome), black and younger patients were more likely than white or older patients to demonstrate the chronic pain syndrome that included higher pain severity, depression, and disability.⁷⁴ Black patients presenting with chronic pain syndrome or disability with mild pain syndrome re-

ported a higher disability level than did white patients within the same syndrome cluster.

Several studies of patients with chronic low back pain have found racial disparities in the evaluation and treatment process. A prospective study of over 1600 North Carolina residents with chronic back pain found blacks reported greater pain and disability than whites.²⁵ Black subjects were rated by their providers as having less severe pain and were less likely than whites to have comprehensive diagnostic and treatment approaches. A medical records review of a national sample of more than 5000 patients with degenerative lumbosacral pathology found that ethnicity and gender predicted the type of workup and treatment.¹⁶⁸ Minority women were 52% less likely than nonminority men to have surgery offered as a treatment option.

Arthritis Pain

Arthritis is a common chronic health problem in the United States, with more than 20% of the adult population affected. Racial and ethnic disparities in the prevalence of arthritis and arthritis-related symptoms (eg, pain) have been found. The 2002 National Health Interview Survey questionnaire was administered to a representative sample of over 31,000 adults.²⁷ The respondents were asked whether they had ever been told by a doctor or other health professional that they had some form of "arthritis," defined as arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia. Blacks had a prevalence of arthritis similar to whites but a higher prevalence of severe joint pain attributable to arthritis. Although Hispanics reported a lower prevalence of doctor-diagnosed arthritis compared with whites, a higher proportion of Hispanics reported severe joint pain.²⁷

Osteoarthritis is the most common chronic rheumatologic condition and a major cause of pain and disability among older adults.^{6,8} Hispanic and African Americans with osteoarthritis are at risk for higher levels of pain and disability, compared with whites.^{41,66} One study of 596 male veterans, however, found no differences in pain intensity between minority and nonminority patients.⁵ The inconsistencies across studies may be related to sample characteristics, access to pain treatments, and the variables controlled for in the analyses.

One factor contributing to disparities in arthritis-related pain may be inequities in the receipt of hip and knee joint replacements. Analyses of data from more than 14,000 adults in the Health and Retirement Study, 1998 to 2004, found that black patients were less likely than white patients to receive a hip or knee replacement surgery, despite demonstrated need.¹⁶² Data from Medicare claims in 2000 and the National Health and Nutrition Examination Survey III also revealed racial disparities in knee replacement surgery rates, with black men and Asian American women less likely to receive the surgery.¹⁶⁰ Overall, there is considerable regional variability in access to surgical procedures, with minorities less likely to receive specialty care. When minority patients are referred for knee or hip surgery, they often report more severe presurgical pain with impaired functioning when

Anderson, Green, and Payne

compared with white patients.^{105,160} These results suggest variability in decision-making in the primary care arena as well as a delay in surgical referral may be associated with lower preoperative functional and health status for minorities, and with less positive surgical outcomes. Thus, additional multicenter studies are necessary to examine the role of health care providers and patient preferences in surgical outcomes for minority patients.

Disparities in medications prescribed for osteoarthritis have also been identified. A retrospective study of a national sample of 6038 veterans with osteoarthritis found that Hispanic veterans were less likely than white veterans to receive a nonsteroidal anti-inflammatory drug with COX-2 selectivity. Both Hispanic and black veterans were likely to receive fewer days' supply of analgesics than were white veterans.⁴³ Another study found African American veterans with osteoarthritis were less likely than white veterans to receive an opioid medication.⁴² The number of days' supply for opioid analgesics was also lower for African American and older patients.

A cross-sectional study of more than 4000 patients with rheumatoid arthritis found Hispanic and African American patients reported more severe pain than white patients.¹⁸ A longitudinal study of 12,090 patients with rheumatoid arthritis also found that self-reported pain was greater in minority patients than in white patients.¹⁹¹ In a sample of 118 patients with early rheumatoid arthritis, Hispanic patients reported greater morning joint stiffness and impaired function, as compared with African American and white patients.¹⁹³ There were no group differences in self-reported joint pain or joint counts.

Other Chronic Conditions

Chronic pain is associated with other chronic diseases and conditions (eg, multiple sclerosis, sickle cell disease, Parkinson disease, headaches, hypertension, cerebral palsy). Limited research has evaluated possible racial or ethnic disparities in pain associated with these chronic conditions. The results, however, suggest that minorities are at risk for increased pain severity and inadequate pain assessment and management.⁶⁹ For example, a survey of a representative sample of adults with chronic health conditions found that Hispanics reported more pain than white adults.⁸⁴

A cross-sectional study of 313 adults reporting a history of chronic headaches found that African Americans were less likely than whites to have received a headache diagnosis or to have been prescribed acute migraine medication.¹²⁷ African American patients also were significantly less likely (46%) than white patients (72%) to utilize the health care setting for migraine treatment. African Americans reported less trust in the medical community and less positive patient-physician communication, variables that were significantly associated with a lack of medical treatment for migraines.

Review of a database of 72,508 patients with hypertension treated in primary care found that 11% of the patients had a chest pain syndrome.⁸³ African Americans

and women with chest pain received fewer medications for reducing pain and associated cardiovascular risk factors than whites and men. Disparities in evaluating chest pain in the emergency department also have been found, with minority and female patients receiving fewer diagnostic tests.¹³³

The US Surgeon General's Report in 2000 noted improvement in the oral health of most people in the United States but pointed out that significant oral health disparities remain among underserved populations.¹⁷⁵ For example, minority and low-income children continue to suffer disproportionately from oral pain and related disease. The recent death of a 12-year-old Baltimore boy from a tooth abscess reveals the devastating consequences of the failure to assess and treat oral pain.¹²⁹ Multiple studies have demonstrated minority status and low income are risk factors for severe orofacial pain and pain-related impairment in daily activities.^{38,147-149,179} A telephone survey of 911 Hispanic adults living in South Florida who reported tooth pain or painful oral sores found lower levels of acculturation, as indicated by less frequent use of English, were associated with greater oral pain and associated depression.¹⁴⁶

In sum, the literature on racial and ethnic disparities in chronic noncancer pain related to illness and other conditions reveals continuing inequities in pain outcomes.^{15,69} In addition to patient-related factors and preferences, variables related to physicians and other health care providers, and factors related to the health care system (eg, structural barriers) must be studied. Most studies compared black and white patients; thus, more studies evaluating Hispanic and other racial and ethnic minorities are needed. What remains unclear is whether these findings reflect undertreatment, over-reporting, differences in pain sensitivity, or some combination. Overall, pain and its sequelae are likely to decrease the overall health and well-being of racial and ethnic minorities while further diminishing their quality of life. Additional prospective research is needed to examine biological, psychosocial, and lifestyle factors that may contribute to disparities in chronic pain.^{41,62}

Cancer Pain

Minority patients with cancer are more likely than non-minority patients to experience delays in diagnosis, follow-up after positive screening tests, and initiation of appropriate treatment plans.^{49,101,154-156} Members of minority groups also have disproportionately high rates of morbidity and mortality from selected types of cancer.^{81,123} Treatment inequities for minority patients also are evident in the treatment of pain associated with cancer, cancer treatment, and cancer survivorship. Inadequate treatment of cancer-related pain among minority patients has been documented consistently in research during the past 15 years. Most of the studies have been cross-sectional investigations of 2 or more racial or ethnic groups that found minority patients with cancer are at risk for more severe pain than nonminority patients.

An early study surveyed more than 1300 nonminority and minority outpatients with metastatic or recurrent

cancer and found that 42% of the patients with pain were prescribed analgesics that were less potent than those recommended by the World Health Organization (WHO) guidelines for cancer pain treatment.³⁷ Patients seen at centers that treated predominately minority patients (African Americans and Hispanics) were 3 times more likely to be undermedicated than patients seen in nonminority settings. A follow-up study examined pain treatment in 281 minority outpatients with recurrent or metastatic cancer.³⁶ The majority of Latino (74%) and African American (59%) patients with pain did not receive appropriate analgesics for their pain. As compared with nonminority patients, minority patients reported less pain relief and were less likely to be adequately assessed for their pain. A subsequent study focused on the pain treatment in low income Hispanic and African American patients.³ Although most patients received appropriate types of analgesics, 65% of the patients reported severe pain. The high levels of pain may have been due to inadequate dosages and/or patient nonadherence to analgesic regimens.⁴ Most patients in both ethnic groups reported taking their analgesics less often than prescribed by their physicians. In addition, the physicians underestimated pain severity for more than half of the Hispanic and African American patients.

A study of 116 low income women who had undergone breast cancer surgery found that African American and Latina women were more likely to report pain and lymphedema as compared with white women.⁵⁰ In multivariate analyses, an increased number of reported symptoms was associated with lower income, being Latina, having a mastectomy, and receiving chemotherapy. Telephone interviews of older African American and white breast cancer survivors found that both groups reported frequent pain, joint stiffness, and fatigue 5 to 9 years after diagnosis.⁶⁵ The symptom experience of both racial groups was comparable, and symptom management was suboptimal.

A survey of a multiethnic sample of 480 cancer patients found ethnic and racial differences in pain and symptom reports.⁸⁹ The Asian Americans reported the lowest pain scores on multiple types of scales. The Hispanics reported the highest scores on visual analog, pictorial, and numerical pain scales. Surprisingly, the visual analog and verbal descriptor pain scores of the African Americans were significantly lower than those of the white and Hispanic participants. Because all participants were recruited from community sites and internet support groups, the samples may not have been representative of larger population groups. A recent descriptive study of 281 outpatients with solid tumors and cancer-related pain found that African American patients reported higher pain intensity ratings as compared with white patients.¹⁷⁶

Only a few longitudinal studies of cancer-related pain have examined whether patients' experiences of pain differed by race.^{15,26,73,91,118} A sample of more than 1000 women with metastatic breast cancer and bone metastases who were enrolled in a clinical trial completed regular pain assessments for 1 year.²⁶ The results indicated that pain severity worsened more rapidly among nonwhite than white women. A longitudinal study of

men ages 65 or older with newly diagnosed prostate cancer found that African American men reported lower quality of life at baseline as compared with white men.⁹¹ At the end of 1 year, the African American men reported more severe pain and urinary symptoms. A recent longitudinal study examining breakthrough pain in whites and nonwhites with advanced cancer found that nonwhites had increased pain severity, more breakthrough pain episodes, and decreased quality of life.^{73,118}

Overall, the literature on disparities in cancer pain management has focused on African Americans and Latinos, although other minority groups are also at risk for under treatment. For example, focus group studies of Native Americans and the rural poor in Appalachia suggest that individuals in these minority groups are at risk for poor assessment and under treatment of cancer-related pain.^{48,88} Future prospective studies should focus on examining the cancer pain experience in all potentially vulnerable and underserved minority populations.

Palliative Care

A limited amount of research indicates significant racial and ethnic disparities exist in palliative and end-of-life care. A review of the literature on palliative care for women with breast cancer concluded that differences in treatment patterns, pain management, and use of hospice care exist between African American women and women in other racial and ethnic groups.¹³² These differences negatively affect pain-related outcomes and quality of life for African American women with breast cancer.

Minority patients are less likely than nonminority patients to enroll in hospice care. For example, less than 10% of patients receiving hospice care in the United States are African American and less than 6% are Hispanic.^{81,120} Similarly, most patients receiving Medicare hospice benefits are non-Hispanic whites.³³ Barriers to palliative and end-of-life care for minority patients include being uninsured or underinsured.⁵⁸ In addition, minority patients and their providers may have limited knowledge of hospice programs and goals. Cultural attitudes and beliefs regarding end-of-life care may negatively affect hospice enrollment.^{40,142} One recent study also found that African American patients who left hospice care were less likely than nonminority patients to re-enroll at the end of life.⁹⁸ Because effective pain management is a primary goal of hospice care, the limited utilization of hospice programs by minority patients may contribute to increased pain and suffering as well as decreased quality of life and disparities in pain care at the end of life.

A retrospective chart review of seriously ill hospitalized veterans found no ethnic differences with regard to pain and symptom management.⁵⁶ The sample sizes of African American and Latino patients, however, were small. A recent review of more than 150,000 Medicare decedents found that minority patients were significantly more likely than nonminority patients to have aggressive end-of-life interventions such as intensive care unit

Anderson, Green, and Payne

treatment and ventilators.⁷⁹ It is not known how these differences affect pain and symptom management.

A sample of 90 patients with advanced congestive heart failure, chronic obstructive pulmonary disease, or cancer who were receiving palliative care in a general medicine practice was followed for 1 year.¹³⁸ Black, Latino, and Asian patients reported more severe pain than white patients, with no significant differences among the minority groups in their pain reports. In addition, there were no differences in pain severity between immigrants and patients born in the United States. Pain management was generally inadequate for all patients, as indicated by infrequent prescriptions for opioids. Another cross-sectional study of cancer patients receiving analgesics from home care or hospice agencies found that the Latino patients reported the most severe pain and reduced quality of life as compared with white and African American patients.⁹⁶ The African American patients, however, reported the most severe "average" pain ratings.

Minority patients who are elderly are potentially a vulnerable population at risk for inadequate pain treatment and palliative care. A study of more than 13,000 elderly Medicare recipients in nursing homes found that minority patients with cancer were less likely than nonminority patients to have a pain score recorded. Even when a pain score was recorded, they were less likely to receive analgesia.¹² Black patients in the nursing homes had a 63% increased probability of no pain treatment relative to white patients. Similar results were found for other racial and ethnic minority group patients, but the small sample sizes limited interpretation of these results.

A recent retrospective review of more than 1000 charts in 12 nursing homes did not find any disparities in pain management related to race or ethnicity.¹⁴⁵ White residents, however, were more likely than minority residents to have do-not-resuscitate orders, living wills, and health care proxies. The authors concluded minority patients' end-of-life care might be adversely impacted by limited advanced care planning.

Overall, the literature on pediatric pain suggests that children are vulnerable to poor assessment and undertreatment of pain complaints regardless of pain type.¹¹² Unfortunately, very little research has evaluated possible disparities in palliative care and associated pain management for pediatric patients.¹⁰⁸ Although pain treatments were not assessed, the results of a few studies of pediatric patients at the end of life suggest pain management may be suboptimal for minority children. When parents provided perceptions of their child's end-of-life care at a pediatric hospital, Spanish-speaking Latino parents described barriers to optimal care due to language issues and cultural expectations regarding physician expressions of caring.³⁹ A recent review of United States death certificate information from 1989 to 2003 found that non-Hispanic black and Hispanic white children with complex chronic illnesses were 40% to 50% less likely to die at home than were non-Hispanic white children.⁵² Unfortunately, whether or not the children were receiving adequate pain treatment was not evaluated. Future

multicenter studies are needed to evaluate possible racial and ethnic differences in pediatric palliative care and to determine if any disparities are related to physician referral choices, cultural variables, or patient preferences.

Pain Epidemiology

Many studies of racial and ethnic disparities in pain have used clinical samples of varying size. A few studies, however, have analyzed large databases of nationally representative samples. Using data from the 2000 Health and Retirement Study, Reyes-Gibby and colleagues¹⁴³ assessed the prevalence and impact of pain in a community sample of 13,777 aging (51 years of age and older) Americans. The Health and Retirement Study is a population-based survey designed to study the health and well-being of aging Americans. The prevalence of pain in the sample was 28%, and 17% of the sample reported activity limitation as a result of pain. Non-Hispanic blacks and Hispanics had higher risk for severe pain compared with non-Hispanic whites. Of those with pain, 27% of blacks and 27% of Hispanics reported severe pain as compared with 17% of non-Hispanic whites. Multivariate analyses revealed that having chronic disease, psychological distress, Medicaid insurance, and lower educational level were significant predictors for severe pain and helped to explain the racial and ethnic differences in pain severity.

A random-digit dial method was used to identify a nationally representative sample of 454 white, 447 African American, and 434 Hispanic community-dwelling adults with chronic pain.¹³⁶ About one third of the respondents in each group reported disabling pain, defined as pain of high severity and high functional interference. The white adults reported longer pain duration but less pain intensity than minorities. Although neither race nor ethnicity predicted disabling pain, the minority respondents demonstrated characteristics predictive of disabling pain more frequently than nonminority respondents. These characteristics included income of \$25,000 or less, being unemployed, and having less than a high school education. Hispanic adults with pain were less likely to have consulted a primary care practitioner for pain (70%) than whites (84%) or African Americans (85%). A lower likelihood of consultation for pain was associated with speaking Spanish, having limited education, being male, young age (18 to 34 years), and unemployment.¹²⁶ The investigators concluded that race and ethnicity, demographics, and socioeconomic factors influence access to care for chronic pain.

Another telephone survey using random-digit dialing procedures and screening questions identified a national sample of 2407 adults with chronic pain.¹⁵² A subsample of 214 African Americans was compared with a randomly selected subsample of 214 non-Hispanic Caucasians. The 2 groups did not differ significantly with regard to pain severity, emotional responses, or treatment status. The African American adults, however, reported greater pain-related interference with daily living, greater difficulties coping, and lower levels of perceived control over pain than the white adults. African Americans reported

greater use of over-the-counter pain medications and less use of prescription analgesics than white respondents. The authors cautioned their results should be interpreted cautiously because socioeconomic variables and access to medical care were not assessed.

A cross-sectional telephone survey of 1037 Hispanic, African American, and white students found that 527 of the students had painful episodes in the previous 6 months.⁸⁰ There were no significant racial or ethnic differences in the total number of painful episodes or the average intensity of the pain. Specific sites of pain were reported with different frequencies across groups. African American students were more likely to report chest and stomach pain, whereas Hispanic students were more likely to report leg and foot pain. White students were more likely to report engaging in self-help behaviors (eg, taking over-the-counter medications) to reduce pain. African American students were the most likely to report using prayer or spiritual coping for pain.

In sum, the epidemiologic studies of Americans with chronic pain indicate racial and ethnic minorities are at risk for adverse outcomes related to pain. Future analyses of large databases of nationally representative samples should help to identify variables associated with disparate pain outcomes and to suggest targets for intervention.

Factors Contributing to Pain Disparities

The barriers to optimal pain treatment for racial and ethnic minority patients include factors related to patients, health care providers, and the health care system. Patient-related barriers may include differences in pain thresholds and tolerances among racial and ethnic groups, genetic factors, and pain-related attitudes and beliefs. Provider-related barriers often include lack of knowledge and training related to pain treatment, inadequate assessment and treatment of pain, and beliefs and expectations regarding minority patients. In addition to patient and provider barriers, minority patients face barriers in the health care system that can adversely impact optimal pain treatment. Limited access to care, lack of insurance or underinsurance, and limited availability of resources needed for optimal pain management are a few of the system barriers.

Patient-Related Variables

Experimental Pain

The biopsychosocial model of pain states that pain perception and response is influenced by a complex interaction of biological, psychosocial, and cultural variables. Among possible biological factors influencing pain are individual differences in nociceptive processing.⁵³ Early laboratory studies of experimental pain documented racial and ethnic differences in pain perception and responses.^{29,181,192} In the past 10 years, advances in experimental pain methodologies have facilitated laboratory studies of pain perception. Perception of heat pain in African American and non-Hispanic white subjects

was explored using multiple assessment methods.⁴⁶ Ratings of heat pain intensity and heat pain thresholds did not differ between groups. The African American subjects demonstrated lower heat pain tolerances and higher ratings of heat pain unpleasantness than the white subjects. Similarly, Sheffield and colleagues¹⁵⁷ found higher ratings of heat pain unpleasantness among African American as compared with non-Hispanic white subjects. In a study of multiple pain tasks, African American and non-Hispanic white subjects were exposed to pressure, heat, ischemic, and cold pressor pain tasks.²⁰ The results indicated significantly lower pain tolerances for heat pain, ischemic pain, and cold pressor pain in African American subjects. Ratings of the intensity and unpleasantness of suprathreshold heat pain stimuli were higher among African Americans.

It is not clear how laboratory differences among racial and ethnic groups in experimental pain relate to differences in clinical pain. Several studies have examined experimental pain sensitivity in chronic pain patients. Edwards and colleagues⁴⁵ found that African American patients with chronic pain demonstrated lower tolerance for ischemic arm pain compared with non-Hispanic white patients. Moreover, pain tolerance was inversely correlated with clinical pain severity and affective distress. In another study of ischemic pain responses, Lawlis and colleagues¹⁰⁶ compared Hispanic, black, and non-Hispanic white patients with chronic spinal pain. Although no group differences in pain tolerance were noted, the Hispanic subjects reported the ischemic pain stimuli matched their clinical pain at a level closer to ischemic pain tolerance as compared with the other groups.

Investigators have started to investigate mechanisms underlying group differences in experimental pain sensitivity. The results of recent studies suggest these differences may be related to racial and ethnic differences in endogenous pain modulation by central pain-inhibitory mechanisms and descending inhibition of pain signals.^{21,22,114} Diffuse noxious inhibitory control refers to a process whereby one noxious stimulus inhibits the perception of a second painful stimulus, a phenomenon thought to reflect descending inhibition of pain signals. In one study, African American and non-Hispanic white subjects were administered electrical pain stimuli before, during, and after an ischemic arm pain procedure.²¹ The ischemic arm condition produced significantly greater reductions in verbal pain ratings of white subjects as compared with African Americans. The investigators concluded that there are differences in endogenous pain inhibition between African Americans and non-Hispanic white subjects. Another recent laboratory study of groups of African American and mainly non-Hispanic white subjects examined the effects of stress-induced increases in blood pressure, norepinephrine, and cortisol on responses to experimental pain stimuli.¹¹⁴ The stress-induced physiological changes were strongly associated with reduction in pain responses among the non-Hispanic white subjects. The investigators concluded that the endogenous pain inhibition associated with the physiological changes was more effective in the non-Hispanic white subjects.

Psychosocial and cultural factors also influence pain perceptions and responses. A study of experimental pain sensitivity in 3 ethnic groups found self-reported ethnic identity was associated with pain sensitivity.¹³⁹ The African American and Hispanic subjects showed lower cold and heat pain tolerances than non-Hispanic white subjects. In addition, pain ranges (tolerance-threshold) for heat, cold, and ischemic pain were lower for the 2 minority groups. Ethnic group identity was associated with pain range only for the African American and Hispanic groups. After controlling for ethnic identity, some group differences in pain range were nonsignificant. The investigators concluded that ethnic identity may partially mediate some ethnic differences in experimental pain sensitivity.

The experimental pain literature on minority group differences in laboratory pain perception and response has mostly focused on African American and non-Hispanic white subjects. Most studies indicate African American subjects demonstrate greater experimental pain sensitivity. Recent studies have included Hispanic subjects, but research evaluating multiple groups of racial and ethnic minorities is needed. The results of the experimental literature must be interpreted cautiously because most of the studies focused on healthy college students. Samples of young college students differ in many ways (eg, age, income, marital status, health status) from samples of individuals experiencing acute and chronic pain. Also, variables such as experimenter race and gender,¹⁸⁵ the subject's psychiatric history,¹⁰³ and type of pain scale²³ may influence subject responses in the laboratory. Although a few studies of clinical samples suggest greater laboratory pain sensitivity is associated with greater clinical pain, additional research is needed to investigate racial and ethnic differences in pain perception and response among representative samples of healthy individuals and people experiencing painful conditions.

Genetic Factors

The role of genetic factors in human pain perception and response is the subject of recent research efforts.⁵⁴ Polymorphisms in specific genes could help to explain variability in self-reported pain. A laboratory study of pain found genetic influences on the variability in pain sensitivity associated with ethnicity.¹⁰² A sample of 500 healthy African American, Asian American, Hispanic, and European American subjects was exposed to painful thermal and cold stimuli. Genotyping was performed to examine polymorphisms in genes that modulate nociceptive transduction (*TRPV1*), opioid analgesia (*OPRD1*), and neurotransmitter metabolism (*COMT*). The results indicated significant variation in allele frequency for these gene loci among the ethnic groups. Female European Americans with the *TRPV1 Val 585* allele showed longer cold withdrawal times than other subjects. Gender, an *OPRD1* polymorphism, and personality characteristics were primary determinants of heat pain sensitivity. The investigators concluded ethnicity, gender, and temperament contribute to individual variation in thermal and cold pain sensitivity by interactions with single nucleotide polymorphisms.

Variants in genes encoding for cytokines have been suggested as risk factors for pain associated with cancer. In a study of 446 white, 125 African American, and 35 Hispanic patients with newly diagnosed non-small-cell lung cancer, polymorphisms in *IL-8-251 T/A* were a significant predictor of severe pain in white but not African American or Hispanic patients.¹⁴⁴ Differences among minority groups were noted in the frequencies of specific genotypes related to IL-8 and IL-6. Possibly due to small sample sizes, no significant associations between genotypes and severe pain were found for the African American and Hispanic patients. Additional research with larger diverse samples is needed to explore the relation of genetic variation to pain among minority groups.

Genetic factors related to race or ethnicity may influence analgesic drug absorption, metabolism, and elimination. Johnson reviewed the literature on the influence of race or ethnicity on the pharmacokinetics of drugs.^{92,93} He concluded differences among racial or ethnic groups might be observed in bioavailability of drugs, hepatic metabolism, renal secretion, protein binding, and distribution. Unfortunately, there is limited research on possible racial or ethnic differences in analgesic pharmacology. Pharmacokinetic studies of codeine demonstrated that 10% of the white population but only 0.5% of black and Asian populations obtain no pain relief from codeine due to the lack of an enzyme necessary for metabolizing codeine to morphine.¹⁷² Studies comparing Caucasian and Chinese patients found differences in the renal elimination of morphine and its metabolites.¹⁹⁵ Additional research is needed to identify any racial or ethnic differences in response to analgesic medications.

Social and ethical concerns have been raised regarding research on possible genetic contributions to health disparities.¹⁴⁰ If racial and genetic categories are primarily sociocultural rather than biological, then their use in genetic research may be invalid.⁶⁷ One concern about a focus on genetic contributions to disparities is that this focus might minimize the importance of environmental and social factors or foster misconceptions about race and ethnicity. Other investigators have pointed out that genetic variants exist that are unique to specific racial and ethnic groups.¹⁵¹ In addition, variability in specific genotypes may differ across racial and ethnic groups. It is important to acknowledge the extreme complexity of the biologic correlates of race and ethnicity and that many nonbiological factors also contribute to health status differences among racial and ethnic groups.¹⁴¹

Patient Beliefs and Coping Strategies

Patients having acute or chronic pain report attitudes, beliefs, and coping strategies that affect their pain outcomes. A number of patient-related barriers to pain assessment have been identified.^{35,116,183,184} For example, patients with cancer or other chronic illnesses often do not want to be labeled as complainers, do not want to distract their physicians from treating the disease, or are afraid that pain means their illness is progressing. Although minority patients share many concerns that limit pain control in non-Hispanic white patients, data

from several studies suggest that some concerns may be reported more frequently among minority patients.^{3,4,115,116,184} For example, many Latino and African American patients describe stoicism and the belief that pain is inevitable.^{4,90,96,115} African American and Latino patients are often concerned about taking potent opioids because they fear that they will become addicted, develop tolerance, or experience intolerable side effects from the analgesics.^{3,4,36} Minority patients also are more likely than whites to feel they should have been referred to a pain medicine specialist sooner and believe a patient's race and gender influence access to pain care.⁷⁰ Studies of Latino and African American patients also have found that many patients rely on alternative and complementary pain treatments and prefer to take analgesics only when pain is very severe.^{4,95,96}

Recent research results indicated significant differences among racial and ethnic groups with regard to coping with pain.⁶⁹ Tan and colleagues¹⁶⁷ found that black patients with chronic pain were more apt than non-Hispanic white patients to use external coping strategies that were associated with increased depression and disability. Several studies found that African Americans and Hispanics with chronic pain are more likely than non-Hispanic whites to report using prayer and other religious coping strategies.^{17,24,47,77,94} Results have been inconclusive with regard to the possible impact of religious coping on pain outcomes. Not surprisingly, variability in coping ability and strategies across and within minority groups also has been found.⁷ Prospective, longitudinal studies are needed to explore possible interethnic, intraethnic, and racial variability in pain coping and beliefs and how these variables relate to pain outcomes.

Health Care Provider–Related Variables

As compared with the literature on patient variables related to pain disparities, relatively little research has examined provider-related variables that contribute to racial and ethnic disparities in pain. The cornerstone for quality pain care is optimizing the provider's pain assessment. Race and ethnicity are important variables that affect pain assessment, especially if there is a language barrier. Disturbing racial and ethnic disparities in pain assessment have been identified. Research results have documented that physicians often underestimate the severity of minority patients' pain.^{3,36} The providers' difficulty with pain assessment may be especially problematic for minorities presenting with pain leading to variability in decision-making and suboptimal pain care, especially for chronic pain. For example, minorities were twice as likely as whites to be disabled 6 months after occupational back injuries.^{163,164} Minority patients with pain are also less likely to receive opioid medications.³⁰

Education on pain assessment and treatment is a neglected topic in medical training, leaving physicians and healthcare providers ill-equipped to manage pain. Numerous studies document that clinicians are not knowledgeable or satisfied with their pain care or their ability to provide culturally competent care for an increasingly diverse society.^{3,76,177,180} Physicians and nurses

treating low income minority patients were asked to rank a list of potential barriers to optimal cancer pain management in their setting.³ Inadequate pain assessment and inadequate staff knowledge regarding pain management were reported as the top barriers by more than half of the health care professionals.

Race and ethnicity may influence providers' beliefs about and expectations of patients.¹⁹ Vignette studies of pain treatment have found mixed results with regard to the effects of patient race and ethnicity. A study of emergency room physicians given short vignettes about patients with back pain, migraine pain, or fracture-related pain found race and ethnicity were unrelated to the decision to prescribe opioids.¹⁶⁵ The physicians were more likely to prescribe opioids for back and migraine pain when the patient had a high-prestige occupation and a strong relationship with a primary care provider.

A second vignette study found interactions between physician gender and patient race. Male physicians provided more pain relief to white patients, whereas female physicians provided more pain relief to black patients with back pain and kidney stone pain.¹⁸⁶ A recent study using a novel virtual human technology found that a small subset of the 54 nurses studied significantly weighted race in their pain-related clinical decision making.⁸⁵ Van Ryn¹⁷⁷ hypothesized that provider beliefs about patients and provider behaviors with patients are independently influenced by the patient's race and ethnicity. For example, providers may use categorical representations (eg, stereotypes) in an attempt to make sense of others.¹⁰⁹

Overall, the research to date indicates race and ethnicity often influence how providers handle pain complaints, and there are differences in assessment and treatment related to minority status. More research is needed to investigate provider-related variables and how they contribute to inequities in pain assessment and management.

Health Care System–Related Variables

Reduced access to health care in general and specialty care specifically contributes to pain disparities, with racial and ethnic minorities and the poor having decreased access to care.^{55,59,68} Neighborhood socioeconomic level also can influence access to health care facilities such as pain management programs.⁵⁵ For individuals who do access care, substandard living conditions may impair pain treatment outcomes.¹⁸² Even when socioeconomic status is held constant, minority patients remain at risk for disparities in pain care.⁶¹ Nonetheless, more studies are needed to examine the impact of availability of neighborhood resources on the pain experience.¹³⁵ For example, when patients receive a prescription for pain medication, minority patients may face additional structural barriers and limited availability of opioids in their hospital or neighborhood pharmacy.^{75,119}

There are more than 47 million uninsured people in the United States.⁶³ Impoverished individuals and minorities are more likely to be uninsured or underinsured than nonminorities and people with greater incomes. Lack

of adequate health insurance limits access to evaluation and treatment of pain. Even federal and state health insurance programs such as Medicare and Medicaid provide less than optimal coverage for pain management. When individuals with pain are treated, availability and cost of analgesic medications are potential barriers to pain management. In a recent study, blacks were more likely than whites to report increased difficulty paying for health care despite having insurance, inability to afford health care, and that chronic pain was a major problem even when they had access to specialty pain care.⁷⁰ They also believed race, ethnicity, culture, and gender influenced access to both health care and pain care. In addition to health care insurance, other factors such as copays and trust influence access to pain care.

Strategies for Reducing Disparities in Pain

Interventions designed to reduce disparities in pain care have focused on the patient, provider, and/or the health care system. Several clinical trials have evaluated patient-focused interventions designed to empower minority group patients to be active partners in their pain management. Such interventions have included education on pain, role-playing interactions with physicians, and suggestions for alternative pain treatments.^{2,97} The results of the trials indicate education alone is probably not sufficient to improve long-term pain outcomes.² Individualized education combined with role playing and specific suggestions for pain treatments is a more promising intervention.⁹⁷

The literature suggests that patient-level interventions with minority patients should use cultural leverage as a framework for designing culturally appropriate treatment strategies.³¹ Cultural leverage is defined as a focused strategy for improving the health of racial and ethnic minority groups by using their cultural practices, philosophies, products, or environments as vehicles that facilitate behavior change of patients and providers.⁵⁷ In other chronic illnesses, cultural leverage has been used in designing patient-focused interventions that include community health workers, navigators, or promodoras.¹⁰⁴ Recruiting individuals from the community with knowledge and training in pain management to act as advocates for the patient's improved pain control is a promising intervention. The involvement of social networks of friends and family also may facilitate positive changes.

The chronic disease literature suggests that minority patients may respond more favorably to personally delivered interventions, as opposed to computer-based or other automated interventions.⁵⁷ Given the importance of technology in 21st century health care, however, it is important to use cultural leverage to develop and evaluate novel interventions for minorities that include modern technology to improve pain outcomes (eg, hand-held computers, telephone monitoring of pain).

Provider-based interventions are needed that focus on implementing recommended pain treatment guidelines and protocols (eg, National Comprehensive Cancer Network pain treatment guidelines). As evidence-based

medicine continues to develop, more research-based guidelines for specific types of pain and pain syndromes will be available. It is important for such guidelines to be based on research that includes studies evaluating the efficacy of the pain treatments for minority patients. Considering other specific variables (eg, economic, cultural) that may affect guideline implementation for minority patients is also crucial. Training providers in communication skills, use of interpreters, and cultural competence is another promising intervention that has been used in other areas of health care. One recent study found that perceptual training to differentiate other-race faces led to reduced implicit racial bias.¹⁰⁷ A model of shared decision-making between the patient and provider also may empower patients and enhance their ability to be partners in their pain management program.

One logistical barrier to optimal pain management for minority patients has been decreased availability of opioid medications in minority neighborhood pharmacies. Studies examining policies as well as strategies ensuring access to opioids (and other pain medications) in minority areas are needed. Changes in the health care systems that provide pain treatments need to include community-based partnerships and initiatives to be successful and accepted by people in the community. Given the complex interaction of patient, provider, and health care system variables related to pain treatment, multi-component interventions will probably prove to be most effective in reducing disparities in pain and pain management among racial and ethnic minorities.

Future Research

The literature on disparities in pain has suffered from inconsistent and discrepant uses of the terms race and ethnicity.⁵¹ Because there are no universally accepted definitions of race or ethnicity, investigators should carefully state the theoretical and operational definitions they use. Most research on pain disparities has focused on non-Hispanic white, Hispanic/Latino, and black/African American populations. Very few studies have included Asian American, Arab American, Native Hawaiian, Pacific Islander, Native American, Alaskan Native, or other racial or ethnic groups. The heterogeneity within the racial and ethnic minority groups that have been studied also has not been addressed. In addition, the non-Hispanic white population is hardly homogeneous. Subgroups may have ethnic identities that can influence pain treatment.^{10,11} Thus, intrarace variability is an important consideration to explore in future studies.

An individual's country of origin, immigration status, and years in the United States are additional factors that may influence pain outcomes. Experiences of discrimination and the process of acculturation are important variables that may impact individuals' pain perception and response, as well as their interactions with health care providers and the health system. Acculturation is defined as a process in which members of one cultural group adopt the beliefs and behaviors of another group, typically the dominant group in a society.¹³⁰ Assimilation of one cultural group into another may be

demonstrated by changes in language preference and adoption of common attitudes and values. Future research on pain-related disparities should address the issues of acculturation, discrimination, and racial and ethnic group heterogeneity and how they may affect pain treatment and outcomes.

When evaluating pain-related variables among racial and ethnic groups, it is important to control relevant variables that may influence pain outcomes. Depending on the study's hypotheses and goals, these variables might include education, occupation, income, neighborhood socioeconomic level, language of choice, and other demographic variables such as gender, age, and marital status. It also is crucial to control for clinical and other health status variables that might influence pain outcomes. The inclusion of process as well as outcome measures in future research also is important. To improve pain treatment and outcomes of minority group members, it may be necessary to change the process of how pain management is delivered.

Conclusions

The scientific, technological, and medical advances yielding increased longevity and quality of life for many non-Hispanic whites have not been uniformly applied to all racial and ethnic groups. Although health and health care disparities continue to attract local, state, and federal attention (eg, NIH, AHRQ), the increasing prevalence of pain and the potential implications of poorly treated pain are devastating for the individual, and the cost to society is staggering. Therefore, ensuring

optimal pain care for all is critically important from a public health and policy perspective. This review reveals the persistence of racial and ethnic disparities in acute, chronic, cancer and palliative pain care across the life span and treatment settings (eg, ambulatory, inpatient), with minorities receiving lesser quality pain care than non-Hispanic whites. This is an important consideration for an increasingly diverse and aging society in which the rising prevalence of pain threatens independence and successful aging. Yet, disparities in pain care continue to be missing from publicized public health agendas and health care reform plans. In fact, although there is considerable legislative activity focused on health disparities, proposed legislation designed to address health care inequities has just begun to focus on pain and disparate pain care in particular (eg, National Pain Care Policy Act).⁶⁸

Because the increasing prevalence of pain has significant and potentially devastating socioeconomic and health ramifications for the individual and society, a robust pain research program must be developed, funded, and more successfully translated into practices and policies specifically designed to reduce and eliminate disparities in care. For instance, culturally and linguistically appropriate interventions must be developed to ensure quality pain assessment and management for minority patients. In addition, extensive efforts are necessary to transform health professional education and healthcare institutions to reduce and eliminate disparities. Toward this goal, metrics should be put in place to monitor outcomes until racial and ethnic disparities in pain care no longer exist.⁶⁸

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Anderson, Green, and Payne

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