

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
 Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Krause, James S.

eRA COMMONS USER NAME (credential, e.g., agency login): KRAUSEJ

POSITION TITLE: Associate Dean for Research, Distinguished University Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION | DEGREE <i>(if applicable)</i> | Completion Date MM/YYYY | FIELD OF STUDY |
|--|----------------------------------|----------------------------|----------------|
| University of Minnesota, Minneapolis, MN | BA | 1980 | Psychology |
| University of Minnesota, Minneapolis, MN | PhD | 1990 | Psychology |

A. Personal Statement

Motivated by my own spinal cord injury (SCI) at age 16 (1971) and having benefited dramatically from the rehabilitative and VR services I received in my home state of Minnesota, I committed my adult life to understanding the long-term consequences of SCI, MS, and other disabling conditions on health, quality-of-life, employment, and longevity.

I hold the rank of Distinguished University Professor. and serve as Associate Dean for Research in the College of Health Professions at the Medical University of South Carolina (MUSC). I currently serve as principal investigator on three different disability rehabilitation research projects (DRRP), including a 50-year longitudinal study of participation after SCI, a 25-year study of opioids and health outcomes after SCI, and a study of quality employment after MS, SCI, and stroke. During my time, we have developed multiple individualized tools for assessing risk of secondary health conditions and adverse health outcomes, experience that will be at the forefront of the proposed research on employment. Having conducted these studies establishes the firm foundation from which to conduct research on quality employment among diverse participants, with translation activities to promote better outcomes among all groups.

Ongoing and recently completed projects that I would like to highlight include:

90DPEM0006

Administration for Community Living - DHHS/ACL

Krause (PI)

9/1/2021 – 8/30/2026

Quality employment throughout the work lifecycle for people with spinal cord injury, multiple sclerosis, and stroke.

90DPHF0009

Administration for Community Living - DHHS/ACL

Krause (PI)

09/01/2020 – 08/31/2025

Risk of Opioid Use Disorder and Related Consequences: A Longitudinal Study of Spinal Cord Injury

90DPCP0009

Administration for Community Living - DHHS/ACL

Krause (PI)

09/01/2020 – 09/29/2025

Aging and Participation after Spinal Cord Injury: Promoting Utilization to Enhance Community Outcomes

90IFRE0044

Administration for Community Living - DHHS/ACL

Krause (PI)

09/01/2020 – 08/31/2023

Understanding and Promoting Longevity after Spinal Cord Injury: A Mixed Methods Study of Participation, Employment, and Quality of Life

SCIRF2017SI-02

South Carolina Spinal Cord Injury Research Fund

Krause (PI)

01/01/2019 – 12/31/2023

Measuring Outcome after SCI throughout South Carolina: Statewide Outcomes Database Special Initiative

90IFRE0028

Administration for Community Living - DHHS/ACL

Krause (PI)

09/30/2019 – 09/29/2022

Number, Primary and Secondary Diagnoses, and Costs of Emergency Department Visits in a Population-based Cohort of People with Spinal Cord Injury

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

| | |
|---------------|---|
| 2021-Present | Distinguished University Professor , Medical University of South Carolina, Charleston, SC |
| 2008-Present | Tenure , College of Health Professions, Medical University of South Carolina, Charleston, SC |
| 2005-Present, | Professor , College of Graduate Studies (secondary appointment), Medical University of South Carolina, Charleston, SC |
| 2004-Present | Director , Center for Rehabilitation Research in Neurological Conditions, Medical University of South Carolina, Charleston, SC |
| 2004-Present | Professor , College of Health Professions, Medical University of South Carolina, Charleston, SC |
| 2003-Present | Associate Dean for Research , College of Health Professions, Medical University of South Carolina, Charleston, SC |
| 2002-Present | Scientific Director , South Carolina SCI Research Fund, Charleston, SC |
| 2002-2004 | Associate Professor , College of Health Professions, Medical University of South Carolina, Charleston, SC |
| 1989-2002 | Psychologist/Behavioral Scientist , Shepherd Spinal Center, Atlanta, GA |

Selected Honors

| | |
|------|---|
| 2023 | SC Governor's award for Excellence in Scientific Research , South Carolina Academy of Sciences |
| 2022 | Keynote Speaker , annual conference of the Academy of Spinal Cord Injury Professionals (ASCIP) |
| 2021 | Excellence Award for Outstanding Leadership in SCI&D Healthcare , American Paraplegia Society (APS) |
| 2019 | Health Care Hero , awarded to professionals and volunteers for health care, research, and other areas who go beyond the call of duty for their communities and their professions, Charleston Regional Business Journal, Charleston, SC |

| | |
|----------------|--|
| 2020,2016,2004 | Scholar of the Year , College of Health Professions, Medical University of South Carolina, Charleston, SC |
| 2018,2010,2008 | NARRTC Research Award(s) , outstanding published paper by a NIDILRR grantee in the previous year (honorable mention 4 other times) |
| 2012 | Distinguished Service Award, National Association of Rehabilitation Research and Training Centers , (previous awardees: Sen. Thomas Harkin, Sen. Robert Dole) |
| 2011 | Medtronic National Courage Award (previous awardees include Sen. Robert Dole, Sen. Max Cleland, Secretary of State Janet Reno, physicist Stephen Hawking, activist Christopher Reeve), Courage Center |
| 2010, 1993 | ARCA Research Award , American Rehabilitation Counseling Association. Awarded for the outstanding vocational rehabilitation manuscript published in a peer-reviewed journal |
| 2008 | Earl B. Higgins Achievement in Diversity Award nomination, Medical University of South Carolina |

C. Contributions to Science

Over the past 30 years, my contributions have developed naturally beginning with investigation of outcomes among those in the community with SCI, then to a heavy emphasis on the identification of risk and prevention of secondary conditions and mortality. We have leveraged this research to develop the capacity to do more detailed studies of quality employment among those with physical disabilities, including the addition of MS and stroke.

(1) Quality Employment Outcomes after Disability Related to Neurologic Conditions. Throughout the course of my career, the study of differences in employment outcomes has been a primary focus due to its importance on the lives of people with disabilities. One of my first publications identified employment outcomes as function of key parameters related to SCI and was awarded the American Rehabilitation Counseling Association (ARCA) award for outstanding manuscript during that year.¹ One of the key findings was that individuals with SCI appeared to be retiring prematurely. Subsequently, I conducted multiple analyses of employment and SCI and, along with my co-author Dr. Karla Reed, received another ARCA award², this time for investigating the relationship of pre-and post-injury education with employment. A critical finding from this study was post-injury education was dramatically more highly related to post-injury employment than was preinjury education, such that at the Masters level of education, preinjury education may not be sufficient to improve employment outcomes. Whereas up until about 2012, I studied employment as a component of larger projects, we applied for and received a Disability Rehabilitation Research Project (DRRP) dedicated to the study of quality employment throughout the work lifecycle for people with SCI, expanding the focus from employment rates to a more meaningful set of outcomes. We extended this work with a sub award from the VCU employment RRTC on employment to persons with MS and further extended this to persons with stroke with a recently awarded DRRP. We have conducted research which has clearly demonstrated inequities in outcomes between people with SCI and MS, with more favorable earnings, benefits, and outcomes among those with MS.³⁻⁵ We have further identified a different pattern of barriers and facilitators between people with SCI and MS.⁶ These findings have clearly demonstrated to the field the importance of going beyond employment rates as the sole markers of employment accomplishments for people with disabilities and the need to include much broader outcomes. This has led us to develop the labor participation model and an enhanced model which looks more completely and quality of employment and its relationships with social participation, health, and longevity.

1. 1993 American Rehabilitation Counseling Association (ARCA) Award, 1993. Outstanding Research Article, Awarded for the outstanding vocational rehabilitation manuscript published in a peer-reviewed journal during the calendar year 1992. Krause, J.S. (1992). Employment after spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 73, 163-169.
2. 2010 ARCA Research Award, American Rehabilitation Counseling Association, March 20, 2010, 1st place award for excellence in publishing in vocational rehabilitation for the manuscript: Krause, J.S., & Reed, K.S. (2009). Obtaining employment after spinal cord injury: Relationship with pre- and post-injury education. *Rehabilitation Counseling Bulletin*, 53, 27-33.

3. Krause, J. S., Dismuke-Greer, C., Reed, K. S., Backus, D., & Rumrill, P. (2020). Gainful employment and earnings among those with spinal cord injury and multiple sclerosis. *Journal of Vocational Rehabilitation, 52*(1), 19-28. doi: 10.3233/JVR-191057
4. Krause, J. S., Dismuke-Greer, C., Reed, K. S., & Rumrill, P. (2019). Employment and job benefits among those with spinal cord dysfunction: A comparison of people with spinal cord injury and multiple sclerosis. *Archives of Physical Medicine and Rehabilitation, 100*(10), 1932-1938. doi: 10.1016/j.apmr.2019.05.031
5. Krause, J.S., Dismuke-Greer, C.E., Jarnecke, M. & DiPiro, N.D. (2022). Career Satisfaction among working age individuals with multiple sclerosis or spinal cord injury. *J Voc Rehab, 57*(1), 33-40. <https://doi.org/10.3233/JVR-221196>
6. Krause, J.S., Li, C., Backus, D., Jarnecke, M., Reed, K., Rembert, J., Rumrill, P., & Dismuke-Greer, C.E. (2021). Barriers and facilitators to employment among those with spinal cord dysfunction: A comparison of participants with multiple sclerosis and spinal cord injury. *Archives of Physical Medicine and Rehabilitation*. <https://doi.org/10.1016/j.apmr.2021.02.015>

(2) Natural Course and Effects of Aging on health, participation, and quality-of-life. For the past three decades, I have been privileged to serve as principal investigator of the most long-standing longitudinal study of SCI, the 50-Year SCI Longitudinal Aging Study. When the study was initiated in 1973 by my mentor Dr. Nancy Crewe, we knew very little about the lives of people with SCI after they left the rehabilitation hospital, particularly that of racial ethnic minorities and those in rural areas. Although not initially intended as a longitudinal study, Nancy and I did a follow-up to this study in 1984 and I took over leadership in 1989, conducting follow-ups as PI every 4-5 years since that time. This study has been instrumental in our understanding of the fundamental natural course of participation, health, employment, and quality-of-life after SCI. Of particular importance, we have identified how longitudinal changes in outcomes over time parallel global environmental changes using sequential designs.^{7,8} We have been particularly able to enroll larger portions of racial ethnic minorities and women into our studies over time, dramatically strengthening the generalizability from the research. Our current work represents a 50-year longitudinal study of community participation which balances our existing earlier work where we have identified changing trajectories of hospitalizations and utilization of services.² Recently, we received the award for the outstanding manuscript of the year among all NIDILRR grantees for our analyses among those with extraordinary survival, having been in the study for the full 40 years, indicated a dramatic increase in the number of non-routine treatments and hospitalizations (this work was recently published and was the focus of an invited awards presentation at the Academy of Spinal Cord Injury Professionals 2015 annual conference).^{9,10} Most recently and of *direct relevance to the current proposal*, I have served as Senior investigator on two important manuscripts using our 45-year longitudinal data to investigate social isolation, including quantifying the separate components of social disconnectedness and perceived isolation,¹¹ their interrelationships, and longitudinal relationship with depression.¹²

7. Krause JS, Sternberg M. Aging and adjustment after spinal cord injury: The roles of chronologic age, time since injury, and environmental change. *Rehabil Psychol.* 1997;42(4):287-302.
8. Krause JS, Cao Y, Bozard JL. Changes in hospitalization, physician visits, and self-reported fitness after spinal cord injury: a cross-sequential analysis of age, years since injury, and age at injury onset. *Arch Phys Med Rehabil.* 2013;94(1):32-7.
9. Krause JS. 40 years of SCI research: Essie Morgan Lectureship. *J Spinal Cord Med.* 2015;38(5):645.
10. Krause JS, Newman JC, Clark JMR, Dunn M. The natural course of spinal cord injury: changes over 40 years among those with exceptional survival. *Spinal Cord.* 2017;55(5):502-8
11. Newman SD, Li C, Krause JS. Social isolation after spinal cord injury: Indicators from the Longitudinal Aging Study. *Rehabil Psychol.* 2016;61(4):408-416.
12. Li C, Newman S, Clark JMR, Krause JS. A five-year longitudinal structural equation model of perceived isolation and social disconnectedness with probable major depression among participants with spinal cord injury. *Spinal Cord.* Under review.

(3) Racial Ethnic Disparities in Outcomes. Because the aging study was initiated in Minnesota at a time when there was little diversity and racial/ethnic minorities were not represented in SCI research, I became interested in attempting to fill the void in our knowledge of underserved populations. We have made consistent contributions to the understanding of racial/ethnic disparities in outcomes after SCI and TBI. I served as first author on three publications focused only on American Indians with SCI,¹³⁻¹⁵ the only such studies to appear in

the SCI literature. I led a Disability and Rehabilitation Research Project (DRRP), entitled the Center for Health Outcomes Research on Underserved Populations with Neurologic Conditions. This center included studies of both TBI and SCI. In terms of specific findings, we identified differential patterns of use of the emergency department (ED), with substantially greater use of the ED among non-white participants, yet a significantly lower risk of hospitalization after an ED visit.¹⁶ In examining the relationship between race-ethnicity and poverty status, we found that while only 14% of White participants were below the poverty level, nearly 42% of Black participants lived in poverty.¹⁷ We have recently identified racial ethnic disparities in quality employment outcomes, including earnings and benefits, participants with both MS and SCI.¹⁸

13. Krause JS, Coker J, Charlifue S, Whiteneck G. Depression and subjective well-being among 97 American Indians with spinal cord injury: A descriptive study. *Rehabil Psychol.* 1999;44:354-72.
14. Krause JS, Coker J, Charlifue S, Whiteneck GG. Health behaviors among American Indians with spinal cord injury: Comparison with data from the 1996 Behavioral Risk Factor Surveillance System. *Arch Phys Med Rehabil.* 1999;80(11):1435-40.
15. Krause JS, Coker JL, Charlifue S, Whiteneck GG. Health outcomes among Americans Indians with spinal cord injury. *Arch Phys Med Rehabil.* 2000;81(7):924-31.
16. Krause JS, Terza JV, Cao Y, Clark JM. Emergency room visits and hospitalizations among participants with spinal cord injury. *NeuroRehabil.* 2015;36(3):313-21
17. Krause JS, Dismuke CE, Acuna J, Sligh-Conway C, Washington K, & Reed K. Race-ethnicity and poverty after spinal cord injury. *Spinal Cord.* 2014;52(2), 133-138.
18. Krause JS, Dismuke-Greer CE, Reed K, Backus D, & Rumrill P. Gainful employment and earnings among those with spinal cord injury and multiple sclerosis. *J Voc Rehabil.* 2020;52(1), 19-28.

(4) Risk and Protective Factors for Mortality. When I first began my work as a graduate student in the late 1980s, life expectancy for people with SCI was believed to be very low with high rates of mortality inevitably related to the severity of the SCI. In my first publication, I used data collected 11 years earlier in relation to current mortality status, identifying several significant relationships between psychosocial and vocational adaptation and future mortality status.¹⁹ Although general in nature, these findings challenged the existing beliefs that life expectancy after SCI was almost fully explained by the severity of the injury and demographic factors, with little hope for change outside of medical interventions to improve function. Our work with mortality has identified several *social determinants* that substantially elevated longevity for those with higher education who are gainfully employed and make a reasonable income.²⁰ We previously conducted the groundbreaking work on psychological and behavioral risk factors for mortality after SCI, finding elevated risk among those who smoked cigarettes, were binge drinkers, and who had a particular pattern of personality traits.²¹ More recently, we identified differential predictors of cause-specific mortality, finding some causes of death due to respiratory system diseases and infective and parasitic diseases highly related to demographic and SCI characteristics, whereas death due to neoplasms and external causes were relatively unrelated to these factors.²² recently, we published the only manuscript to our knowledge on unintentional drug poisoning (i.e., prescription drug overdose) and mortality after SCI.²³ This line of research has led to several individual awards for scholarship.

19. Krause JS, Crewe NM. Prediction of long-term survival of persons with spinal cord injury: An 11 year prospective study. *Rehabil Psychol.* 1987;32:205-13.
20. Krause JS, Saunders LL, Acuna J. Gainful employment and risk of mortality after spinal cord injury: effects beyond that of demographic, injury and socioeconomic factors. *Spinal Cord.* 2012;50:784-8.
21. Krause JS, Carter RE, Pickelsimer EE, Wilson D. A prospective study of health and risk of mortality after spinal cord injury. *Arch Phys Med Rehabil.* 2008;89(8):1482-91.
22. Krause JS, Cao Y, DeVivo MJ, DiPiro ND. Risk and protective factors for cause-specific mortality after spinal cord injury. *Arch Phys Med Rehabil.* 2016;97(10):1669-1678.
23. Krause JS, Cao Y, DiPiro N, Cuddy E. Personality, high-risk behaviors, and elevated risk of unintentional deaths related to drug poisoning among individuals with spinal cord injury. *Arch Phys Med Rehabil.* 2018;99(10):1941-1948.