

Madonna Model System of Rehabilitation Care for Patients Post-COVID-19

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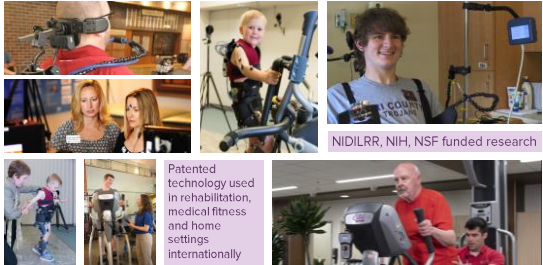
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4th Largest rehabilitation hospital system in the country based on 2021 patient revenue.



Institute for Rehabilitation Science & Engineering



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Objectives

- Describe benefits of a model system of rehabilitation care for patients Post-COVID-19.
- Explore opportunities for statewide healthcare collaboration to enhance function, fitness, and psychosocial wellbeing of individuals Post-COVID-19.

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Internal Steering Committee

Member	Organizational Role
Judith M. Burnfield, PhD, PT	Director/Institute for Rehabilitation Science and Engineering COVID-19 Model System Project Director
John Glenn	Vice President of Development
Lynn Hallowell-Gottleben	Vice President of Rehabilitation
Travis Graft, PhD	Senior Director of Neuropsychology
Jeff Gromowsky	Vice President and Physician Practice Administrator
Ryan Knight, PT, DPT	Post-COVID Program Manager
Brandon Luethke	Director of Hospital Applications
Linda Sullivan	Vice President of Referral Relations
Lori Terryberry-Spohr, PhD	Director of Rehabilitation Programs
Katie Williams	Director of Marketing and Communications

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External Steering Committee

Existing and Anticipated Members
Academic Colleagues
Clinical Partners
Industry Partners
Nebraska Department of Health and Human Services
Patients

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Post-COVID Conditions

Long COVID
Late Sequelae
Chronic COVID
Long-haul COVID

Post-Acute COVID-19
Long-term Effects of COVID
Post-Acute COVID Syndrome
Post-acute Sequelae of SARS-CoV-2 Infections

Madonna.org Post-COVID Conditions: Information for Healthcare Providers (cdc.gov)

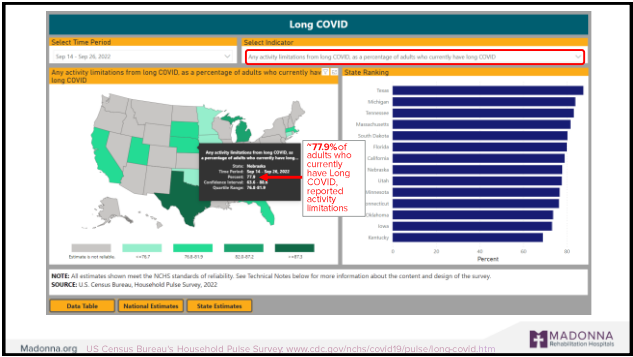
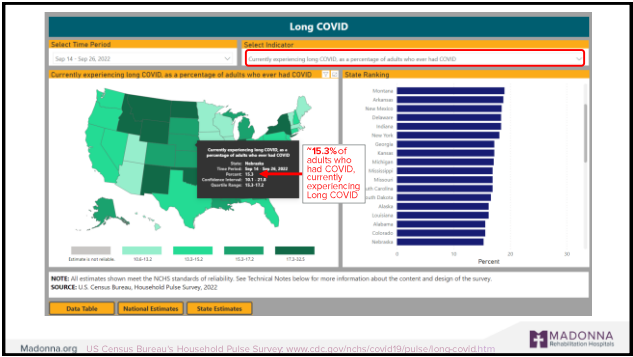
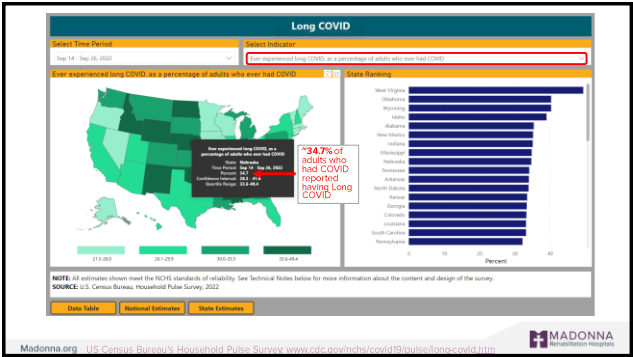
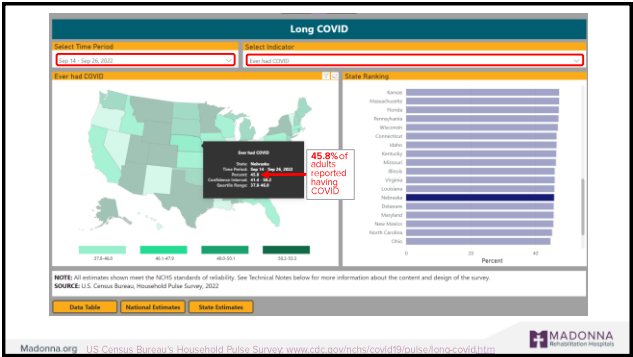
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Common Post-COVID Symptoms

Dyspnea / increased respiratory effort	Diarrhea
Fatigue	Sleeping difficulties
Post-exertional malaise / poor endurance	Fever
Cognitive impairment/ brain fog	Lightheadedness
Cough	Impaired daily function and mobility
Chest pain	Pain
Headache	Rash
Palpitations and tachycardia	Mood changes
Arthralgia	Anosmia or dysgeusia
Myalgia	Menstrual cycle irregularities
Paresthesia	Erectile dysfunction
Abdominal Pain	


Madonna.org Post-COVID Conditions: Information for Healthcare Providers (cdc.gov)

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Estimated Impact of COVID-19 on Nebraska

	Proportion	Nebraskans
Nebraska Census 2020		1,961,504
Adult Nebraskans (> 18) based on 2020 Census	75.3%	1,477,013
Adult Nebraskans ever having COVID	45.8%	676,471
Adult Nebraskans ever having COVID who reported ever having Long COVID	34.7%	234,736
Adult Nebraskans ever having COVID who reported currently having Long COVID	15.3%	103,500
Adult Nebraskans currently having Long COVID and activity limitations	77.9%	80,627



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Nebraska

State Profile Report | 10.13.2022


COVID-19 Community Level by county

Category	Low	Medium	High
# of Counties (Change)	22 (44)	22 (22)	9 (9)

Low Counties: Adams, Anderson, Boone, Brown, Butler, Cass, Cedar, Cherry, Cheyenne, Clay, Colfax, Cuming, Currie, DeWitt, Douglas, Fillmore, Franklin, Gage, Garfield, Grant, Greeley, Hall, Hamilton, Harlan, Holt, Kearney, Keith, Lincoln, Logan, Laramie, Lancaster, Lincoln, Madison, Nemaha, Nemuro, Norfolk, Onawa, Pawnee, Phelps, Pierce, Platte, Polk, Red Willow, Richardson, Rock, Sarpy, Saunders, Scottsbluff, Sherman, Sioux, Stanton, Thomas, Valley, Washington, Wayne, Webster, York, York.

Medium Counties: Boone, Butler, Cass, Cedar, Cherry, Cheyenne, Clay, Colfax, Cuming, Currie, DeWitt, Douglas, Fillmore, Franklin, Gage, Garfield, Grant, Greeley, Hall, Hamilton, Harlan, Holt, Kearney, Keith, Lincoln, Logan, Laramie, Lancaster, Lincoln, Madison, Nemaha, Nemuro, Norfolk, Onawa, Pawnee, Phelps, Pierce, Platte, Polk, Red Willow, Richardson, Rock, Sarpy, Saunders, Scottsbluff, Sherman, Sioux, Stanton, Thomas, Valley, Washington, Wayne, Webster, York, York.

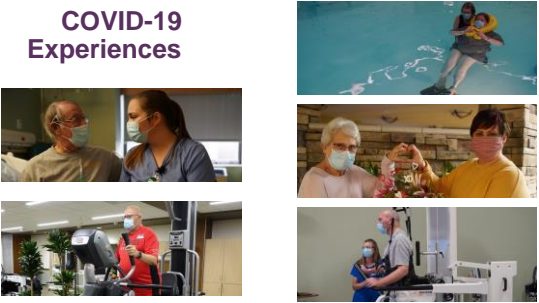
High Counties: Adams, Anderson, Boone, Brown, Butler, Cass, Cedar, Cherry, Cheyenne, Clay, Colfax, Cuming, Currie, DeWitt, Douglas, Fillmore, Franklin, Gage, Garfield, Grant, Greeley, Hall, Hamilton, Harlan, Holt, Kearney, Keith, Lincoln, Logan, Laramie, Lancaster, Lincoln, Madison, Nemaha, Nemuro, Norfolk, Onawa, Pawnee, Phelps, Pierce, Platte, Polk, Red Willow, Richardson, Rock, Sarpy, Saunders, Scottsbluff, Sherman, Sioux, Stanton, Thomas, Valley, Washington, Wayne, Webster, York, York.



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<https://madonnadata.org/Community/COVID19-State-Profile-Report-Nebraska/#5c67f7>


COVID-19 Experiences






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Model System Genesis






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Madonna's COVID-19 Model System of Care




Inpatient

- Specialty Hospital
- Acute Rehab
- TCU



Outpatient

- Comprehensive Clinic
- Discipline Specific
- Day Rehab




Community

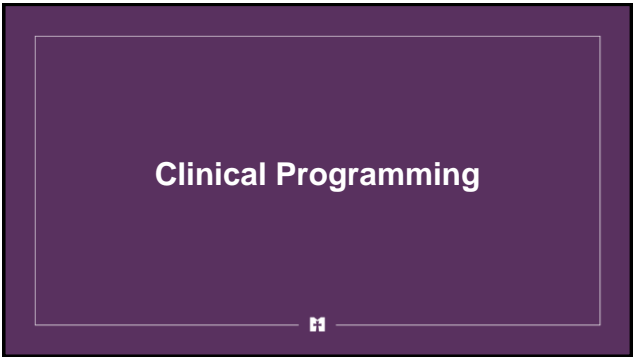
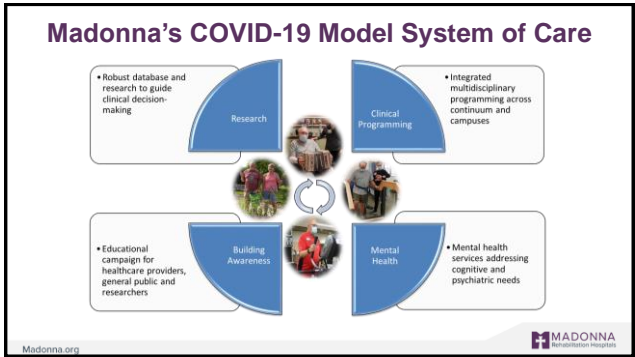
- ProActive
- Fit for Work

← Excellent clinical care · State-of-the-art technology · Cutting-edge research →

Collaboration within and external to Madonna to manage the complex consequences of COVID-19 across the life span



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Post-COVID-19 Big View

- 1/3 of patients with severe COVID-19 demonstrate neurological complications
 - Dizziness
 - Headache
 - Stroke
- Research has shown early interdisciplinary rehab can prevent long-term maladaptive coping and increase return to work/life
- Many patients have other systems impacted in addition to their neurological changes

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Who Are We Seeing?

- Acute Post-COVID-19 and Long COVID-19 for diverse and comprehensive rehab needs
- Age ranges from 18 to 90 year (majority 40 to 60 years)
- Frequently female
- Prior health ranges from no notable underlying medical challenges to medically complex

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Common Symptoms We're Seeing...

- Shortness of breath and other respiratory function changes (strength, endurance, coordination)
- Cardiac concerns: POTS, dysautonomia, and BP/HR regulation
- Fatigue and poor energy conservation
- Brain fog, cognitive dysfunction, word finding deficits
- Nerve pain
- Sleep disorders
- Vision issues
- Anxiety/depression

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Entry into Madonna's Continuum of Care

- Long Term Acute Care Hospital (Specialty Hospital)
- Acute Rehabilitation Hospital
- Transitional Care Unit
- Comprehensive Post-COVID-19 Rehabilitation Clinic
- Day Rehabilitation Program
- Outpatient Therapy
- ProActive Medical Fitness
- Fit for Work

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Why Work Environment Focus?

Figure 1: More than 30 million working-age Americans may have had long Covid

That is one out of seven working-age Americans

Category	Millions of people
Working-age Americans	203 million
Working-age Americans who have had COVID-19	103 million
Working-age Americans who may have had long Covid	31 million

Source: Author's estimate based on data from U.S. Census Bureau, CDC, and ICD Data Health. Brookings Metro

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Patient Experience in our Post-COVID Model of Care

- Initial Phone Screening for history
- Evaluation
 - PT, OT, Speech, Counseling and Psychiatry
 - Standardized assessments to establish baseline with therapies
 - Physiatrist appointment provides wrap up and next steps
- Plan of Care
 - Individualized based on patient's needs
 - Treatment is typically 2x per week
 - Duration typically 4-8 weeks but can vary considerably based on patient needs
 - Can include any combination of team members (including respiratory therapy, spiritual care, recreational therapy)
 - Updates provided back to referring physician generally every 2-4 weeks
- Continued Team Approach
 - Team meetings; Charting benchmarks; Follow up services as needed
 - Fit For Work

Discipline	Role
Physiatry (PM&R)	Assessment, overall coordination and plan of care
Physical Therapy	Increase mobility, aerobic conditioning, balance, strength
Occupational Therapy	ADL and IADL, independence with return to vocational roles, vision
Speech Therapy	Compensatory strategies for cognitive-communication needs, dysphagia, voice, respiratory strength and coordination
Counseling	Anxiety/coping/postICU related PTSD
Social Work	Team coordination, outreach to payers, support and resources for patients/families
Nurse Case Management	Prescreening of referrals for needed add on services and medical support, liaison to physicians
Neuropsychology	Neurocognitive and mental health assessments; return to work screening needs
Respiratory, Spiritual Care, Recreation Therapy	Consultation and clinical services that are available on as needed basis

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Interdisciplinary Model

- Multidisciplinary approach has significant benefits when pursuing holistic care
- Coordinated team approach developed based on national models and research, and years of intensive rehabilitation experience
- Individualized patient educational materials provided on initial evaluation through treatment

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Why Team Approach?

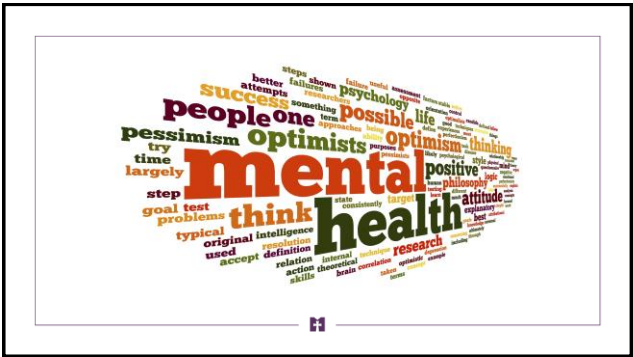
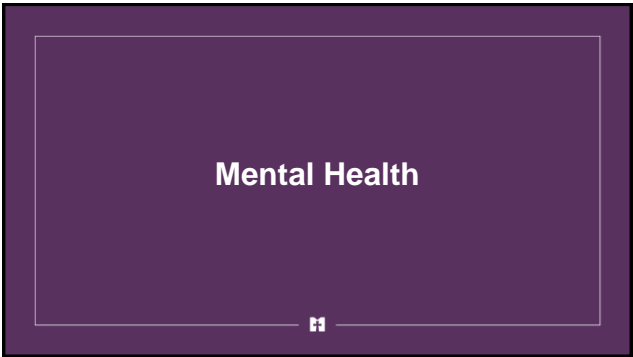
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Accessing Model System Clinical Services

For more information, clinicians and patients can call

402.413.3930

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- Limited mental health services statewide
- For many patients, it's important, even vital, to address cognitive and psychological concerns with Speech Therapy and Counseling, prior to initiating Physical and Occupational therapy.
- Not surprising based on what is being reported in literature
 - Anxiety
 - Adjustment to Change in Functional Status / Loss of Identity
 - Depression
- Premorbid considerations, acute recognition of a chronic problem?



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POST-COVID
EDUCATION & SUPPORT



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POST-COVID
EDUCATION & SUPPORT

As you recover from COVID-19, it's important to support your recovery with a team of professionals. Madonna's Post-COVID Education & Support program is designed to help you with your recovery. We offer a variety of services, including:

- Group Therapy: A safe space to share your experiences and learn from others.
- Individual Therapy: One-on-one sessions with a therapist to address your specific needs.
- Family Therapy: Support for your family members who are also recovering.
- Support Groups: A place to connect with others who are going through the same experience.

OMAHA ZOOM MEETINGS

Join us for a Zoom meeting on Thursday, October 20th, 7:00 PM - 8:00 PM. Register for free at [https://www.madonna.org/post-covid-education-support](#).

LINCOLN ZOOM MEETINGS

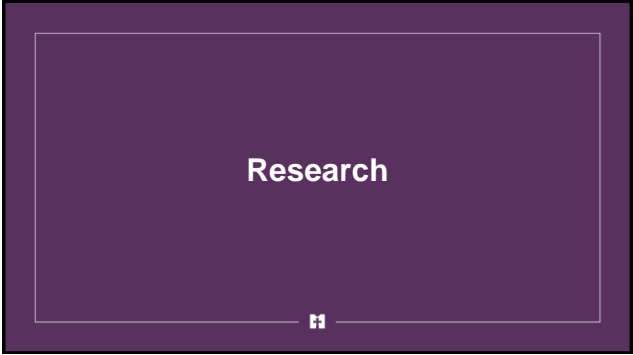
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CONTACT PROGRAMS

Omaha Campus: [https://www.madonna.org/post-covid-education-support](#)
Lincoln Campus: [https://www.madonna.org/post-covid-education-support](#)

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- Led by skilled facilitator
- Monthly meetings (Lincoln & Omaha)
- Open to public participation
 - Good place to learn and share
 - Patients just want to be heard!
 - In person and/or via virtual participation (ZOOM)
- Please spread the word!



Initial Collaborative COVID-19 Research

Rehabilitation Outcomes for Patients Post COVID-19


- Burnfield JM et al (2022). Six Minute Walk Test changes during long-term acute care hospital rehabilitation for patients post COVID-19. *Archives of Physical Medicine and Rehabilitation*, 103(3):e13-e14. DOI: <https://doi.org/10.1016/j.apmr.2022.01.036>.
- Makam, Burnfield et al (2022). Recovery After Transfer to an LTCH for COVID-19 (RAFT COVID Study): A national multicenter cohort. *Journal of the American Geriatric Society*, 70(S1): S132.

Perceptions of Virtual Care Rehabilitation during COVID-19

- Manes MR, Burnfield JM, Boersma K, Peoples J, Davis A, Beneciuk J, Bialosky J, Jordan K, Osborne R. Virtual Rehabilitation and COVID-19: A multi-site survey of patients' and providers' satisfaction with care during a pandemic. In review. *INQUIRY* (INQ-22-0885).

Family Mental Health during COVID-19


- Ben Briq A, Williams N, Esteirou R, Acero ID, Mesurado B, Debellu P, Storopoli JE, Orellana ON, James SL (2022). Parental mental health and child anxiety during the COVID-19 pandemic in Latin America. *Journal of Social Issues*, 101(11):josi12523.



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Recovery After Transfer (RAFT) from Hospital to LTACH for COVID-19



- National multicenter cohort: 12 LTACH systems comprising 17 LTACHs across US
- ~4,000 COVID-19 patients admitted between 3/2020 and 2/2021 to participating LTACHs
- Data Sources
 - CARE Survey Admit & Discharge patient assessments
 - Case Record Forms (extra clinical details re: hospital & LTACH stays)
 - Longitudinal surveys at 6 & 12 month follow-up


Research supported by grants from National Association of Long Term Hospitals, National Institute on Aging and the Donaghue Foundation (Principal Investigator: Anil Makam, MD, MAS, UCSF)

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6 Minute Walk Test (6MWT)

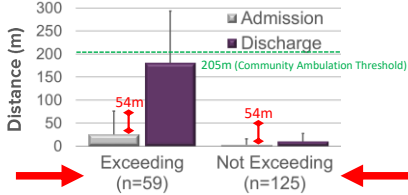
- Record distance walked during 6 minutes (Admission, Discharge)
- Measure of walking and cardiopulmonary function
- 54 m (~177 ft) = Minimal Clinically Important Difference (MCID) for individuals with pulmonary disease



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6MWT Distance for those Exceeding and Not Exceeding Threshold for Significant Improvement (54 m)



Group	Admission (m)	Discharge (m)	Improvement (m)
Exceeding (n=59)	~100	~154	54m
Not Exceeding (n=125)	~20	~74	54m

- Burnfield JM et al (2022). Six Minute Walk Test changes during long-term acute care hospital rehabilitation for patients post COVID-19. *Archives of Physical Medicine and Rehabilitation*, 103(3):e13-e14. DOI: <https://doi.org/10.1016/j.apmr.2022.01.036>.
- Makam, Burnfield et al (2022). Recovery After Transfer to an LTCH for COVID-19 (RAFT COVID Study): A national multicenter cohort. *Journal of the American Geriatric Society*, 70(S1): S132.

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Implications for Therapy and Research

- Need for sustained rehab beyond inpatient to improve **function and stamina** critical for community reintegration and long-term health
- Critical to identify optimal treatment strategies to enhance outcomes during formal rehab and post-discharge



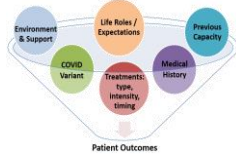
Burnfield JM, Votto JJ, Hays A, Stuart M, Lewis LL, Prettyman E, Makam A (2022). Six Minute Walk Test changes during long-term acute care hospital rehabilitation for patients post COVID-19. *Archives of Physical Medicine and Rehabilitation*, 103(3):e13-e14.

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Moving Forward

Research to guide understanding of short- and long-term outcomes, predictors of recovery and exacerbation, and optimal treatments



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COVID-19 Research Data Set Linking Surveillance, Treatment (Acute & Rehab) with Outcomes

- Capturing existing and new metrics
- Key metrics currently recorded in EMR
 - Defining expanded set of common data elements that would help track outcomes across healthcare continuum and following discharge.
 - Practical strategies for implementing internally and with partners across Nebraska
- Partnerships essential for robust data set and for making maximal difference for individuals impacted by COVID across Nebraska and nation**



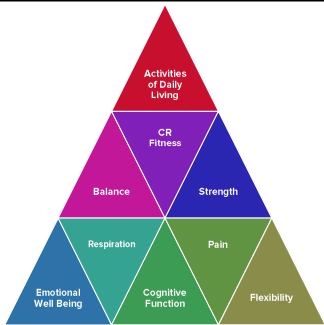
Wearable Sensors

- Doctors visits and therapy sessions provide only brief snapshot of individual's capabilities and body's response
- Wearable sensors could provide meaningful insights into physical activity patterns and physiologic responses (e.g., HR, oxygen levels, sleep patterns, stress) 24/7
- Data could be used to educate patients and identify predictors of pending decline or improvement



Prospective Studies

- Pilot and RCT studies comparing impact of select interventions on key outcomes
- Data needed to guide understanding of best practices



Community Awareness

Community Awareness Campaign

- Patients and families need trustworthy and digestible information to guide informed decision-making regarding treatment options and existing research
- Need to develop educational content for healthcare providers and general public on the relative value of rehabilitation services

Summary and Discussion

Summary

- Madonna's Model System for Post-COVID-19 Rehabilitation bridges clinical, research, and community awareness
- Leverages Madonna's expertise with external partners to help individuals Post-COVID-19 have best shot at getting back to doing things they value in their homes/communities.
- Work conducted under Model System auspices will guide
 - Understanding of recovery patterns, treatment and costs, and rehabilitation outcomes following COVID-19
 - Best practices

Ways to Get Involved

- Work collaboratively to ensure patients have access to much needed comprehensive post-COVID clinical and mental health services
 - Multidisciplinary inpatient and outpatient
 - Clinical / mental health services
 - Post-Rehab exercise programming
 - Patient support groups
- Collaborate on research
 - Data repository including surveillance data
 - Prospective research studies
- Community Awareness: Long COVID is real, it happens, and Nebraska's healthcare system is ready to help

Contact Information

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Disclosures

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