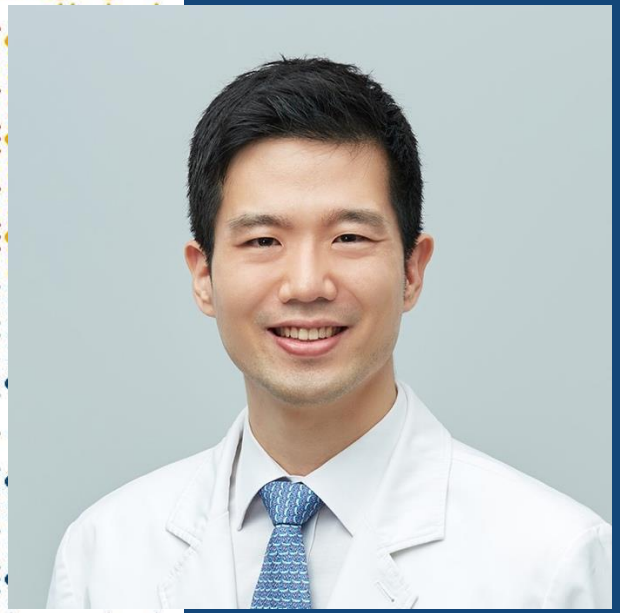
Datafication of Disabilities: Innovative Data-Driven Decision Making with CDISC

Presented by Inpyo Jeon, Leader, Functioning R&D Center,
Seoul Rehabilitation Hospital



Meet the Speaker

Inpyo Jeon

Title: Leader

Organization: Functioning R&D Center, SRH

Physiatrist who helps persons with disabilities live healthy lives and conducts research to empower human functioning.

Disclaimer and Disclosures

- *The views and opinions expressed in this presentation are those of the author(s) and do not necessarily reflect the official policy or position of CDISC.*

- *The author(s) have no real or apparent conflicts of interest to report.*

Agenda

1. Impact of RWD & RWE on Routine Clinical Practice
2. Disability as the Endpoint of Clinical Trials
3. RWD-driven Precision Rehabilitation
4. Expectations of Innovative Rehabilitation Using CDISC

Impact of RWD & RWE on Routine Clinical Practice

Integrating clinical trials into routine clinical practice

21st Century Cures Act

New innovations faster and more efficiently to patients

Funding for NIH Innovation Projects under the Cures Act

- Precision Medicine Initiative: $1,455,000,000 (2017-2026)
- Brain: $1,511,000,000 (2017-2026)
- Cancer Moonshot: $1,800,000,000 (2017-2023)
- Regenerative Medicine: $30,000,000 (2017-2020)
  - *Cures | National Institutes of Health (NIH)*

21st Century Cures Act

New innovations faster and more efficiently to patients

Pragmatic Clinical Trials

- Pragmatism in clinical trials arose form concerns that many trials did not adequately inform practice because they were optimized to determine efficacy.
  - *Ford, I. and Norrie, J. (2016). Pragmatic Trials. New England Journal of Medicine, 375:454-463.*
- Clinical trials designs include some elements that more closely resemble routine clinical practice, which are sometimes described as “pragmatic”
- These pragmatic clinical trials often rely on RWD and have the potential to generate RWE.
  - *Frameworks for FDA’s Real-World Evidence Program*

21st Century Cures Act

New innovations faster and more efficiently to patients

Innovative Routine Clinical Practice

- "Real World Evidence" means data regarding the usage, or the potential benefits or risks, of a drug derived from sources other than traditional clinical trials.
  - *Section 505F(b) of the FD&C Act*
- Leveraging established health care institutions and existing clinical expertise in the medical community can reduce startup times and speed up enrollment.
  - *Integrating Randomized Controlled Trials for Drug and Biological Products Into Routine Clinical Practice Guidance for Industry (Sept. 2024)*

Disability as the Endpoint of Clinical Trials

Health is not merely the absence of disease

Endpoint of the Treatment of Alzheimer's disease

Endpoint of Lecanemab

Lecanemab, monoclonal antibody medication

- CDR-SB(Clinical Dementia Rating-Sum of Boxes)
  - Based on interview
  - Assess functional performance including community affairs, home and hobbies, and personal care
- ADCS-MCI ADL
  - Based on questionnaire or interview
  - Assess functional performance of activities of daily living including eating, walking, toileting, using telephone, etc.
    - *LECANEMAB CONFIRMATORY PHASE 3 CLARITY AD STUDY MET PRIMARY ENDPOINT, SHOWING HIGHLY STATISTICALLY SIGNIFICANT REDUCTION OF CLINICAL DECLINE IN LARGE GLOBAL CLINICAL STUDY OF 1,795 PARTICIPANTS WITH EARLY ALZHEIMER'S DISEASE | Biogen*

Endpoint of Combination Therapy for the Sequalae of Stroke

Endpoint of Cerebrolysin combined with speech and language therapy

Cerebrolysin, mixture of enzymatically-treated peptides derived from pig brain

- WAB(Western Aphasia Battery)
  - Test
  - Assess functional performance including reading, writing, etc.
- Barthel Index
  - Based on interview and observation
  - Assess functional performance of basic activities of daily living including eating, walking, toileting, etc.
    - *Speech therapy combined with Cerebrolysin in enhancing aphasia recovery after acute ischemic stroke: ESCAS pilot study | medRxiv*

Datafying Disability

Performance defined by International Classification of Functioning, Disability and Health (ICF)

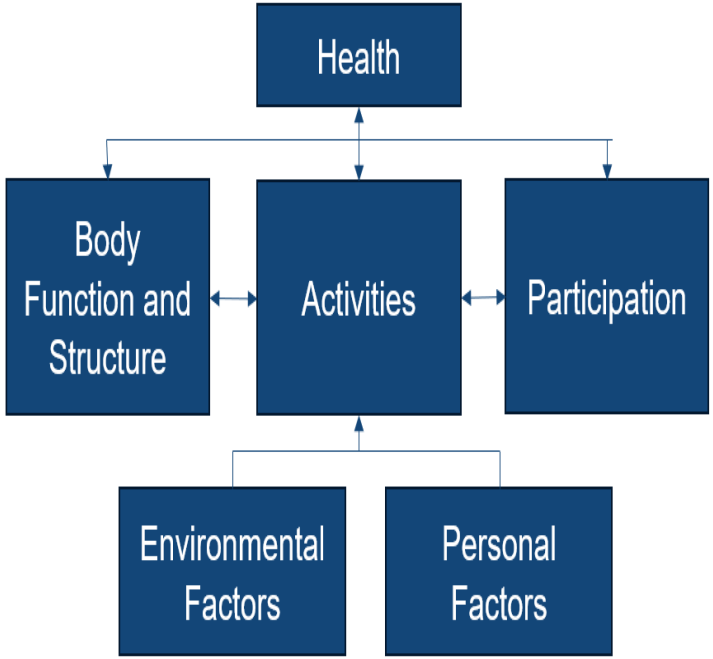
Performance relates to what the person actually does in his or her 'current' environment.

- The gap between capacity and performance reflects the difference between the impact of current and uniform environments, and thus provides a useful guideline as to what can be done to the environment of the individual to improve performance (WHO 2001:15).
    - *CDC, The ICF: AN OVERVIEW*

Datafying Disability

Environmental factors

- Assess capacity in ‘standard’ environment
- Assess performance with 'current' environmental factors



Datafication of Disability

WHO Disability Assessment Schedule (WHODAS2.0)

Generic assessment instrument developed by WHO to provide a standardized method for measuring health and disability across cultures.

- Sufficiently reliable and sensitive to measure the difference made by a given intervention.
- Based on the report about the experience of difficulty, not assistance level.
- Cognition, mobility, self-care, getting along, life activities (household and work) and participation domains
    - *Measuring health and disability : manual for WHO Disability Assessment Schedule (WHODAS 2.0)*

- Seoul Rehabilitation Hospital utilize WHODAS2.0 in current environment to decision-making process for rehabilitation goal setting.

Datafication of Disability

Advantages of ICF-based datafication

Tool for promoting healthy lives by providing a comprehensive framework to understand and measure health and disability.

- Holistic assessment
- Patient-centered care
- Interdisciplinary collaboration
- Education and advocacy

RWD-driven precision rehabilitation

RWD, not only for clinical trial but also for clinical practice

Single Case Experimental Design (SCED)

Randomized N-of-1 trial as Level 1 evidence for treatment decision purposes in individual patients

Testing the effect of an intervention using a small number of patients

- Repeated measurement
- Sequential (± randomized) introduction of an intervention
- Analysis of effect individually.
    - Agata Krasny-Pacini, Jonathan Evans, *Single-case experimental designs to assess intervention effectiveness in rehabilitation: A practical guide*, Annals of Physical and Rehabilitation Medicine, Volume 61, Issue 3, 2018, Pages 164-179

- Routine clinical practice may be the SCED without pre-defined protocol

Routine clinical practice with RWD

RWD may improve the quality of routine clinical practice

RWD from trial-specific activities in homes and other locations may

- Increase the frequency of routine measurement
- Decrease the loss of routine measurement

RWD from trial-specific activities delegated to local healthcare providers may

- Improve the quality of routine measurement
- Solve the problem of data-silo effect between local healthcare providers

- **Integrated RCT utilizing RWD related to disability may lead to the innovation of precision rehabilitation**

Expectations of Innovative Rehabilitation Using CDISC

Pragmatic clinical trial ready routine clinical practice

CDISC for Data Standards of RWD

New innovations faster and more efficiently to persons with disabilities

Aggregation of standardized SCED data can answer to generalized research questions.

- CDISC Therapeutic Area Data Standards
  - AD, PD, DMD, MS, TBI
  - no Cerebral Palsy
- CDISC QRS Standards
  - WHODAS2.0, ADCS-ADL MCI
  - no FIM(Functional Independence Measure)

CDISC for Data Standards of RWD

New innovations faster and more efficiently to persons with disabilities

High quality RWD from innovative rehabilitation should be aggregated to make RWE for persons with disabilities.

- CDISC and HL7 FHIR mapping guide released in this spring 2024
- HL7 FHIR and WHO-FIC interoperability collaboration on progress

- CDISC may lead to promotion of this process for hybrid or pragmatic clinical trials, particularly for persons with disabilities who was difficult to participate in the traditional clinical trials

Thank You!

Clinical trials utilizing RWD can lead to innovations in routine clinical practice.

Routine clinical practices generating good RWD can speed up clinical trials.