

# An online training system to enable systematic delivery of study protocols in multisite neuroimaging

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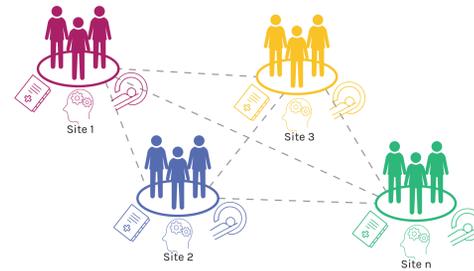
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## PROBLEM How to facilitate consistent protocol delivery in multisite studies?

Multisite studies involve the administration of a common data collection protocol across disparate institutional locations. Although multisite studies allow access to a greater number of participants, they are prone to issues surrounding protocol consistency, data reconciliation and coordination<sup>1</sup>.

To ensure the data collection protocol is consistently applied at separate study sites, each with their own unique staff (Figure 1), multisite studies often use in-person training or online training, or some combination of the two<sup>2,3</sup>.

Figure 1 Multisite studies: study staff at disparate sites delivering the same protocol



## SOLUTION An online training system.

Our group has recently developed the Training Module: an online platform, integrated within LORIS<sup>4</sup>, that allows staff members at study sites to receive standardized training. LORIS helps to alleviate the logistical difficulties multisite studies face through a centralized data repository and numerous study and data management tools.

The Training Module can be used to train site staff to administer any test comprised in the study's test battery.

To get started with the Training Module, a training administrator must develop training content which is then inserted into the LORIS database.

Figure 2 The LORIS training system

**Training Centre**

Users navigate amongst training units from the main Training Module page. The user can complete training units (found in the incomplete column), or review content for which they have already been certified (found in the complete column).

**Training Unit**

**a. Training Content**

Users progress through a series of tabs containing the training content. A variety of training media are accepted.

i. Text content

ii. PDF content

iii. Video content

**b. Quiz**

A multiple choice quiz evaluating a user's comprehension of the training materials rounds out a training unit.

After going through the training content, users must complete a multiple choice quiz.

If their answers are not all correct, the user can either view the corrections, or be required to go through the training unit again (study administrator's choice).

**Certification**

Upon successful completion of a training unit, the user is certified to administer a test in the study test battery. They can review the training materials at any time from the Training Centre.



LORIS is an open-source web application for data coordination and data sharing, specifically designed for multisite neuroimaging studies. It is created and maintained by the McGill Centre for Integrated Neuroscience.

Website  
loris.ca

GitHub  
github.com/aces/Loris

Publications  
Das, S., et al. (2016). *NeuroImage*, 124, Part B, 1188-1195.

Das, S., et al. (2012). *Frontiers in Neuroinformatics*, 5.

## CONCLUSION + FUTURE WORK Part of an ecosystem of multisite study management tools.

LORIS's Training Module can be used as complementary or an alternative to existing training methods in multisite studies. It is flexible, offering training possibilities for various types of tasks and allowing for many types of training content. It aims to facilitate and improve the consistency of protocol delivery and inter-rater reliability<sup>5</sup> in multisite studies.

The Training Module's benefit is ultimately derived from being part of a larger study management application (see LORIS). Useful study management abilities emerge from the interaction between the different tools and data repository.

### Future Developments

**Improved Training Centre Interface**  
 Advanced filtering of training units; progress status displayed (Figure 3).

**Front-end Training Content Upload & Editing**  
 Ability for a training administrator to upload and edit training content directly from LORIS (Figure 4).

**Training for Tasks Outside of Test Administration**  
 Certification for other procedural skills site staff may require to systematically deliver the protocol.

Figure 3 Planned Training Centre Interface

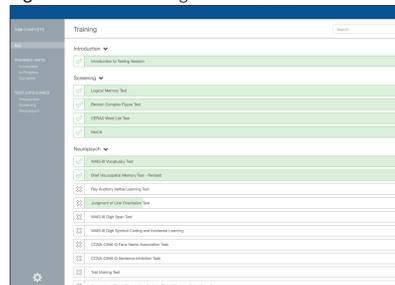
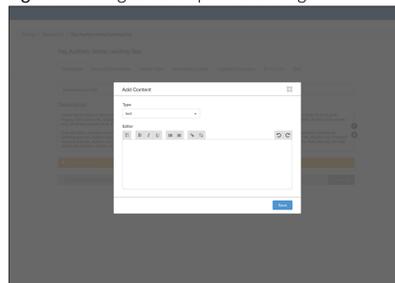


Figure 4 Training Content Upload & Editing



## DEMO

Try the Training Module on our LORIS demo website

<https://demo.loris.ca/training>



## THE TRAINING MODULE IN USE

The Canadian Consortium on Neurodegeneration in Aging

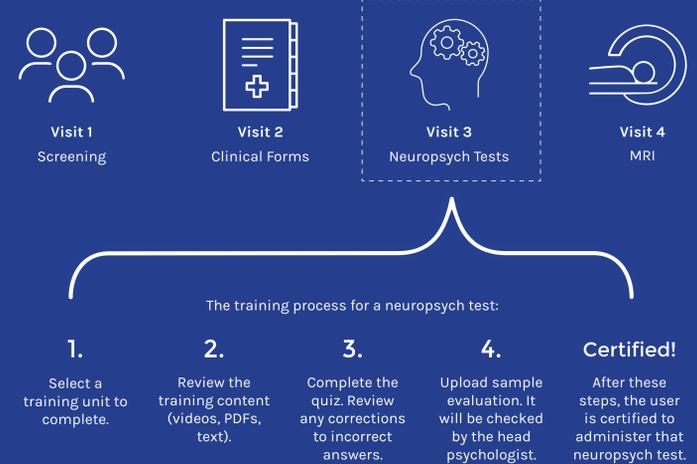
The Canadian Consortium on Neurodegeneration in Aging (CCNA) is the largest study on dementia in Canada, collecting data on 1600 participants at over 30 sites across Canada.

Figure 5 CCNA data collection sites



CCNA is using LORIS as their study and data management system, and we developed the Training Module for their use. The Training Module has been used by CCNA to teach site staff how to consistently administer neuropsychological tests.

Figure 6 The CCNA Training Process



## CCNA TRAINING IN NUMBERS

- 28 training units
- 116 examiners completing training
- 35 data collection sites
- 939 certifications

## ACKNOWLEDGEMENTS

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