NephroCAGE

German-Canadian consortium on AI for improved kidney transplantation outcome

1st NephroCAGE Symposium, May 20, 2021

Nephrology Disease Cooperation between Canada and Germany for Applied AI

Project Meeting Kick Off

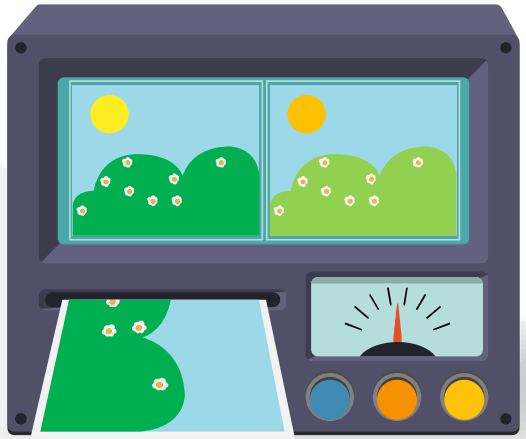
May 20, 2021

WP2: Local Data Extraction

Dr. Ruth Sapir-Pichhadze B Med Sc, MD, MSc, PhD, FRCPC

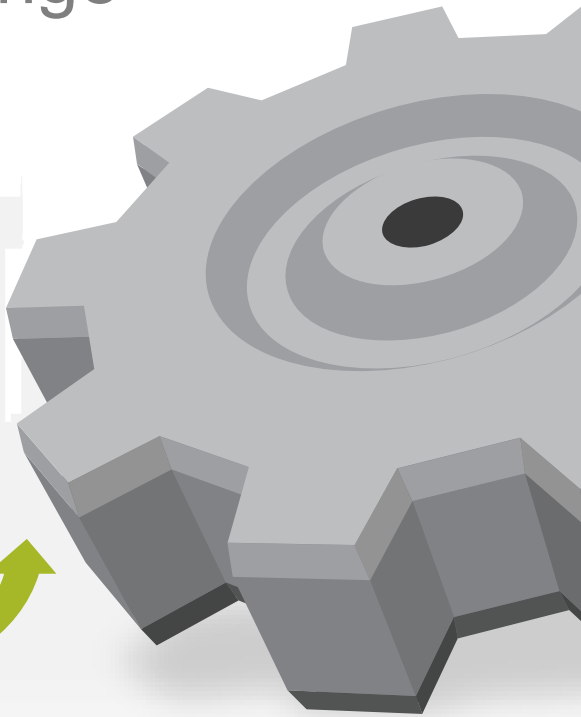
McGill University Health Centre

01 Project
Objective

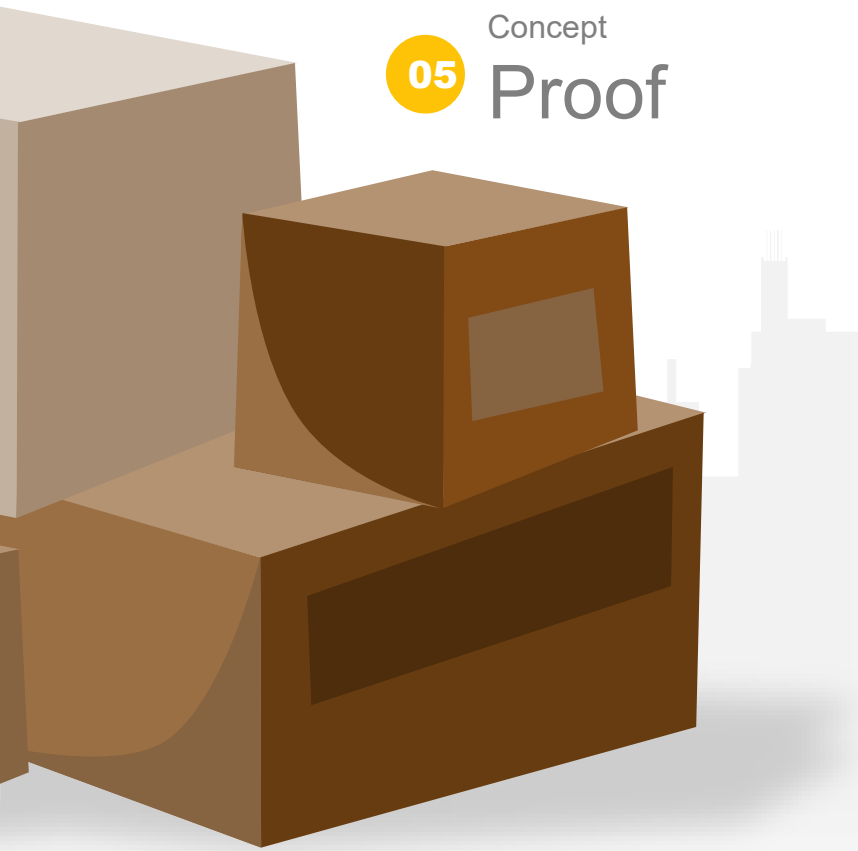


02 The
Need

03 The
Challenge



04 Explore solutions



Concept

05 Proof

Objective

Predict long-term kidney allograft survival using federated machine learning

Need

Large observational studies for robust inferences

Challenge

Data ownership and confidentiality issues relating to data sharing in international collaboration

Explore solutions

Examine data sharing models in international context

Proof

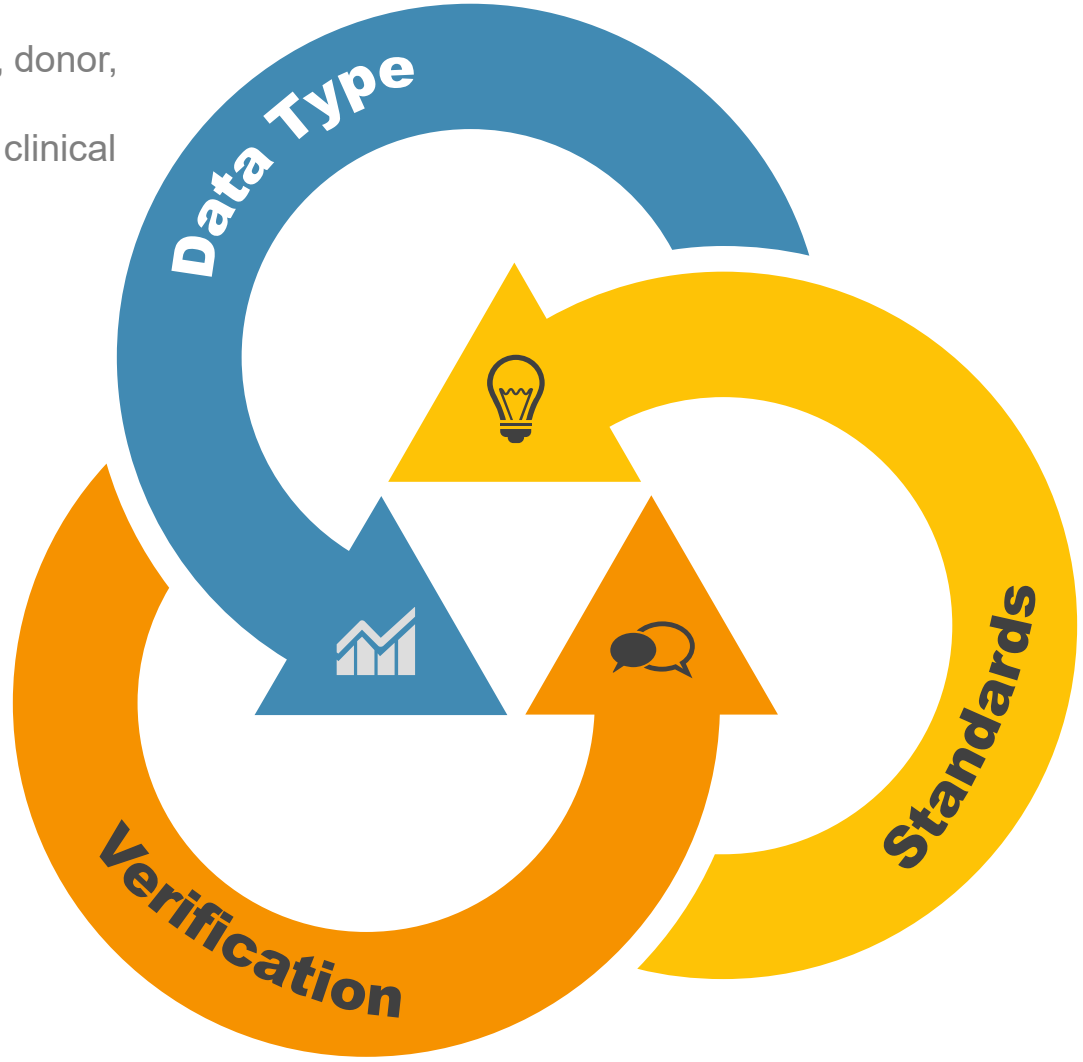
Develop and inform international data sharing best practices

Issues for Consideration

Data

Clinical datasets:

- comprehensive recipient, donor, transplant data
- longitudinal immune and clinical monitoring parameters
- therapeutic interventions



Verification of data validity and completeness

Heterogeneity in standard operating procedures, data format, data content, synchronicity of measures curated of 3 cohorts :

- Germany - Charite
- Quebec - McGill University Health Centre and Centre Hospitalier de l'Université de Montréal
- BC – PROMIS database

Establishing a Minimal Set of Variables

1 OBJECTIVE

Establish minimal set of variables for research questions and aim toward harmonization

2 DETERMINE

- Priority outcomes and their definitions
- Inform immune risk
- Select
  - Recipient, donor, transplant characteristics
  - Immune and clinical parameters
  - Therapeutic interventions

3 STAKEHOLDER ENGAGEMENT

Collaborative and respectful process for engaging stakeholders:

- Workshops
- Teleconferences
- Electronic communications, and
- Committees

4 Participants

- Steering committee
- Data team
- Additional engagement of:
  - Experts in immunogenetics
  - Pathologists
  - Transplant clinicians

Data Processing and Harmonization

Assess
Assessment of harmonization potential

Select
select core variables to be harmonized

Algorithm
Centrally developed data processing algorithms

Define
Define variables across curated data dictionaries

Implement
Implementation of data processing algorithms at participating centers

ENSURE

- Documentation of process and decisions taken during harmonization for transparency and reproducibility
- Document quality of the harmonized dataset
- Sustainability plan to allow long-term utilization of dataset and support for users

SIGNIFICANCE

- NephroCAGE will serve as a proof of principle that decentralized analysis and federated machine learning can ensure:
    - Confidentiality of individual participant data
    - Generalizability of observations and robustness of inferences

THANK YOU!

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