



Knowledge Generation with EHR Data

- How much can be learned at the population level?
 - How are findings validated?
- How much can be learned at the patient level?
 - Are there “Patients like me?”
 - What can be done with the information?
- How can we optimize (accelerate) learning healthcare system activities?
 - Embedded randomization



Samuel L Jackson Pulp Fiction



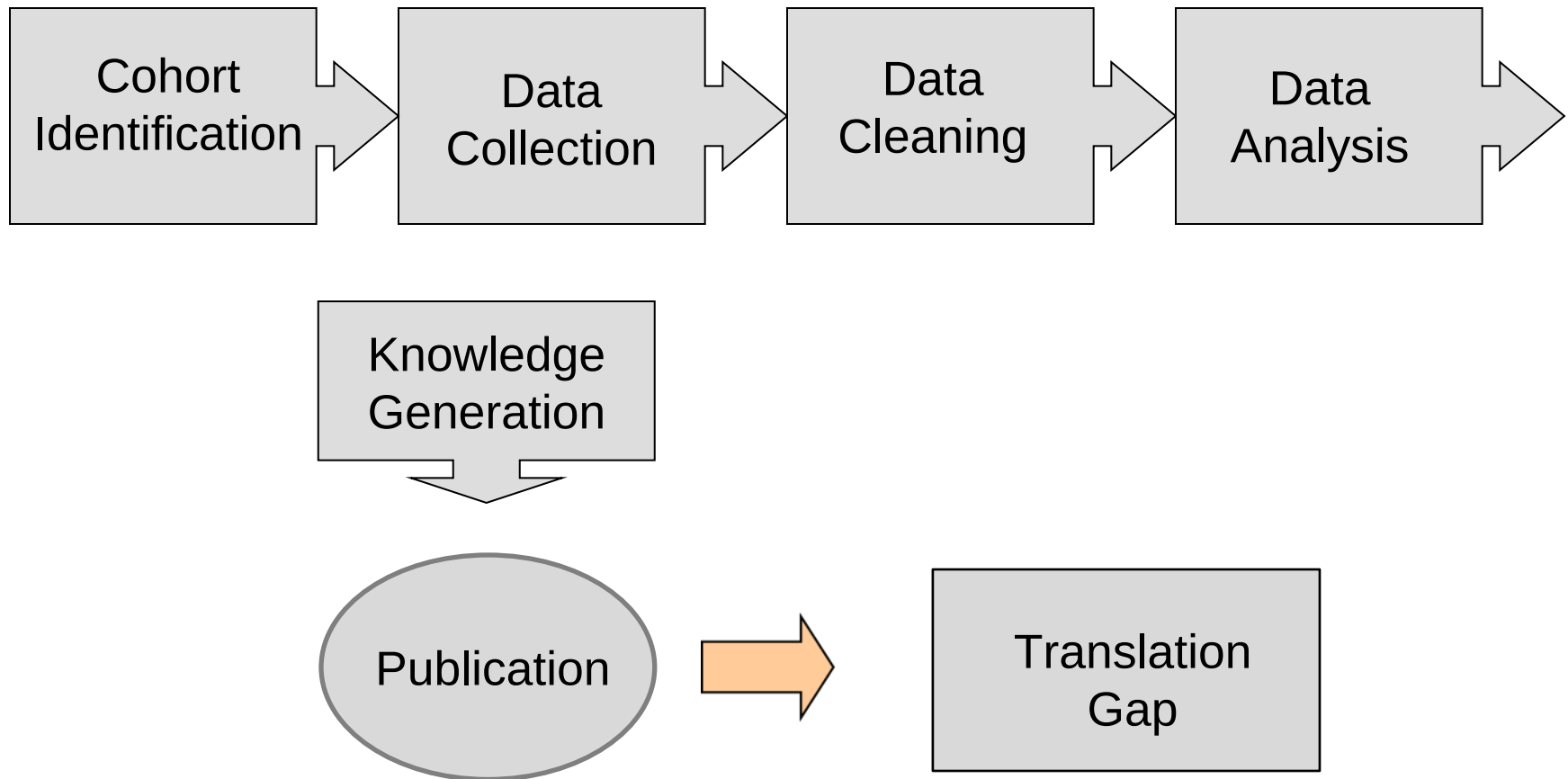


Learning Healthcare System Tool Kit

- Infrastructure
 - EHR Data
 - EHR Application
 - Sophisticated Analytics
- Embedded clinical trials - ability to perform experiments
 - At low cost
 - Iteratively
 - At large scale
 - Pragmatically
 - Translatable results
- Decision support modules

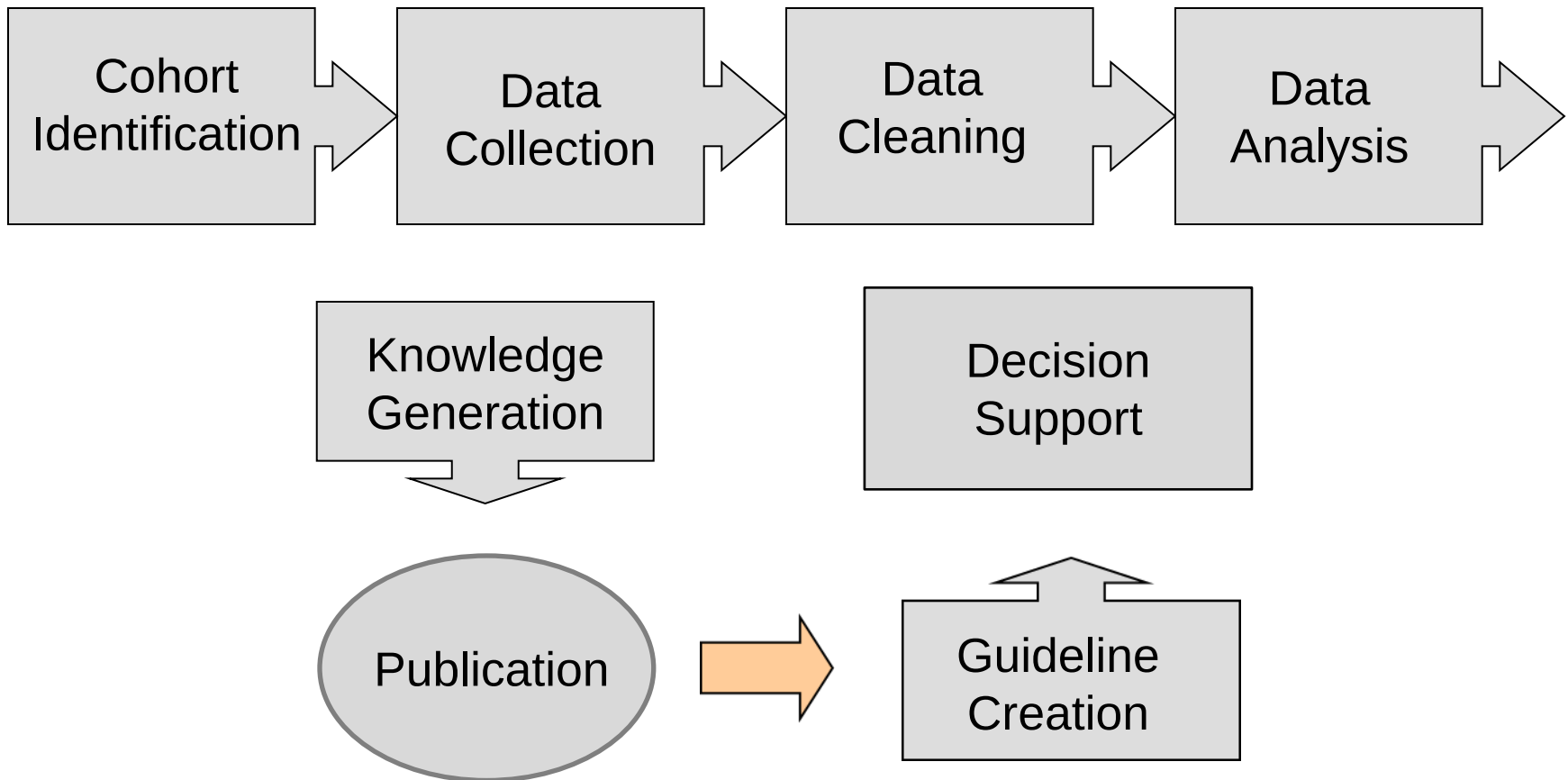


Traditional Observational Health Research



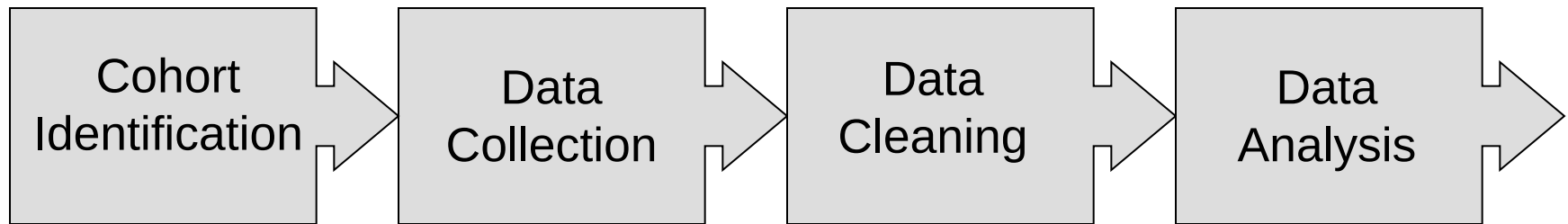


Observational Research with Guideline Implementation



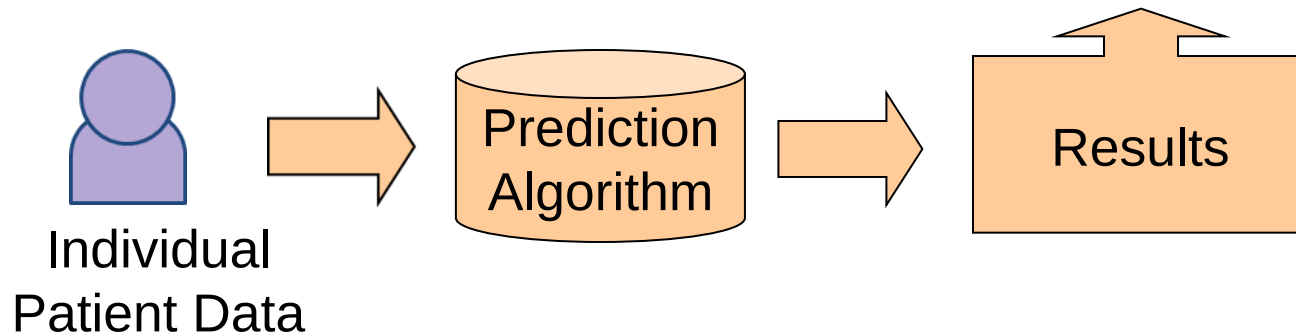


Local Learning and Implementation



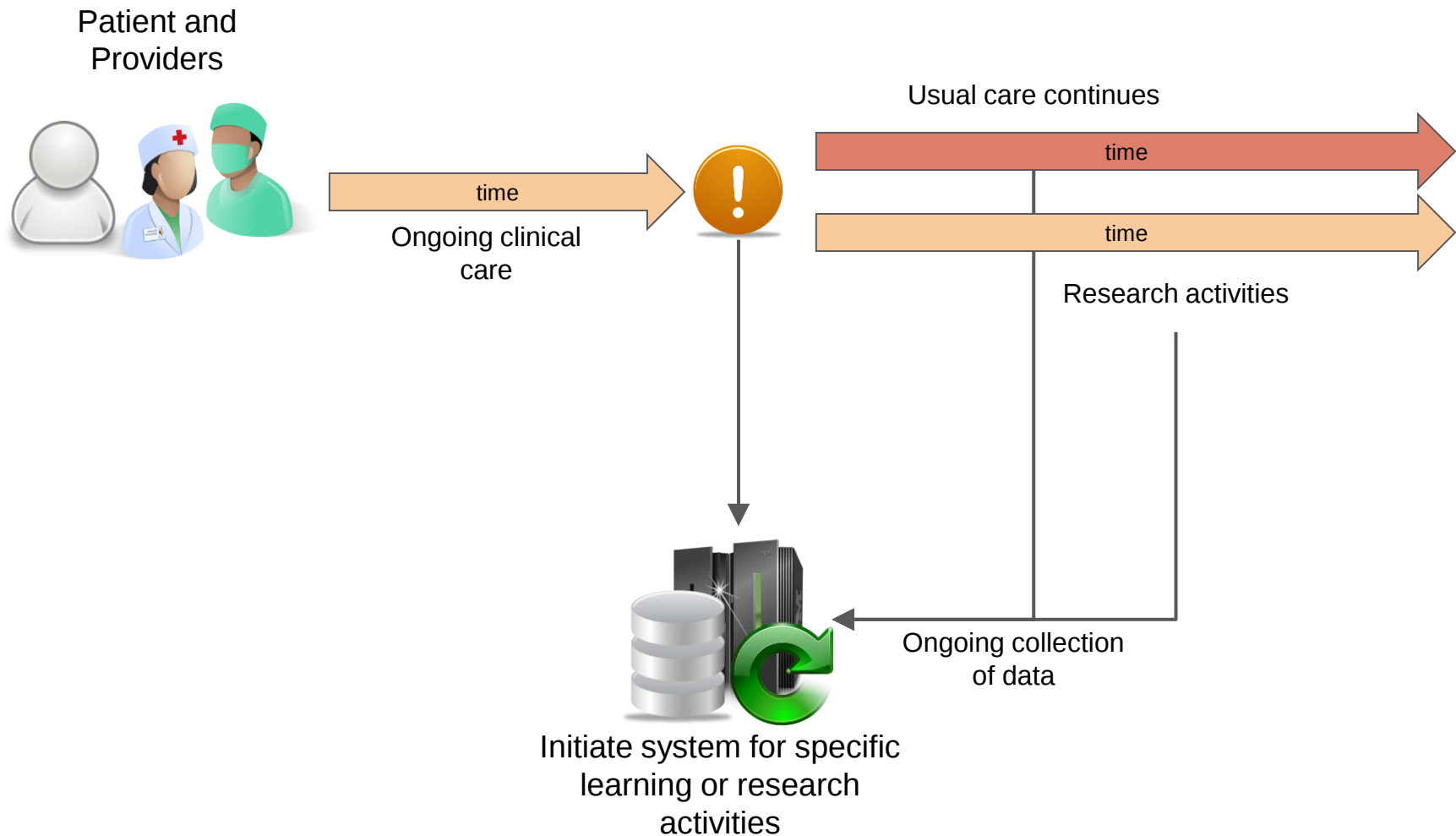
Knowledge
Generation

Patient Specific
Decision Support



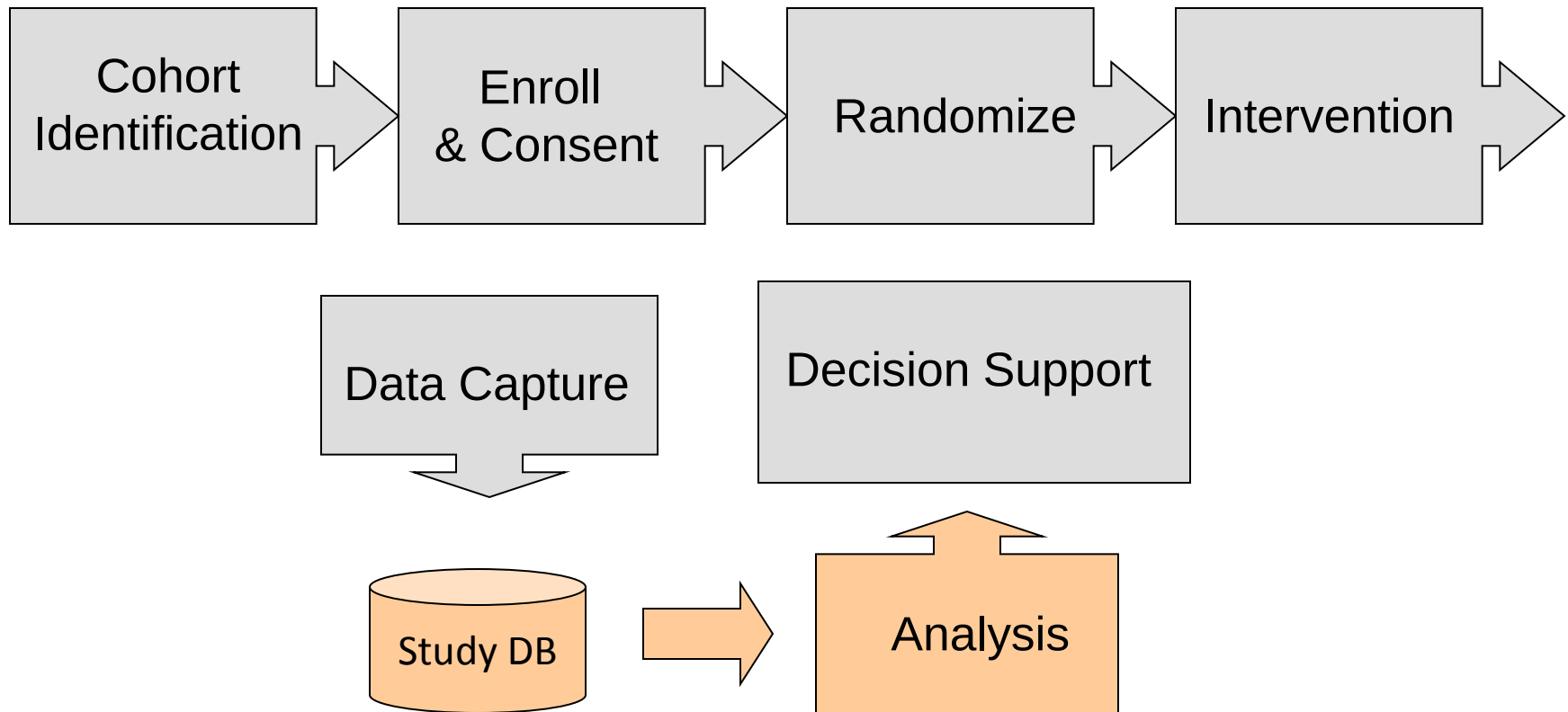


Integration of Randomization into Clinical Care





Point of Care Clinical Trials





Exemplars

- Insulin Study
 - Randomization to sliding scale or weight based insulin regimens
 - Recruitment from EHR without a registry or data warehouse
- Diuretic Comparison Study
 - Randomization to hydrochlorothiazide or chlorthalidone
 - Recruitment from Corporate Data Warehouse
- Precision Oncology Program
 - DNA targeted sequence with subsequent enrollment into matched clinical trial
 - Recruitment from the Precision Oncology Clinical Data Repository



Local Learning Through Experiments

