

Translational Research: Priorities for Enabling Computer-Based Medical Systems

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Outline

- Big Data Analytics as Disruptive Innovation
- Translational Research Priorities
 - Solutions that meet the need
 - Scalability/Reliability/Resiliency
 - Change Management
 - Education and Training
 - Evaluation



BIG DATA



VOLUME

DATA SIZE



VELOCITY

SPEED OF CHANGE



VARIETY

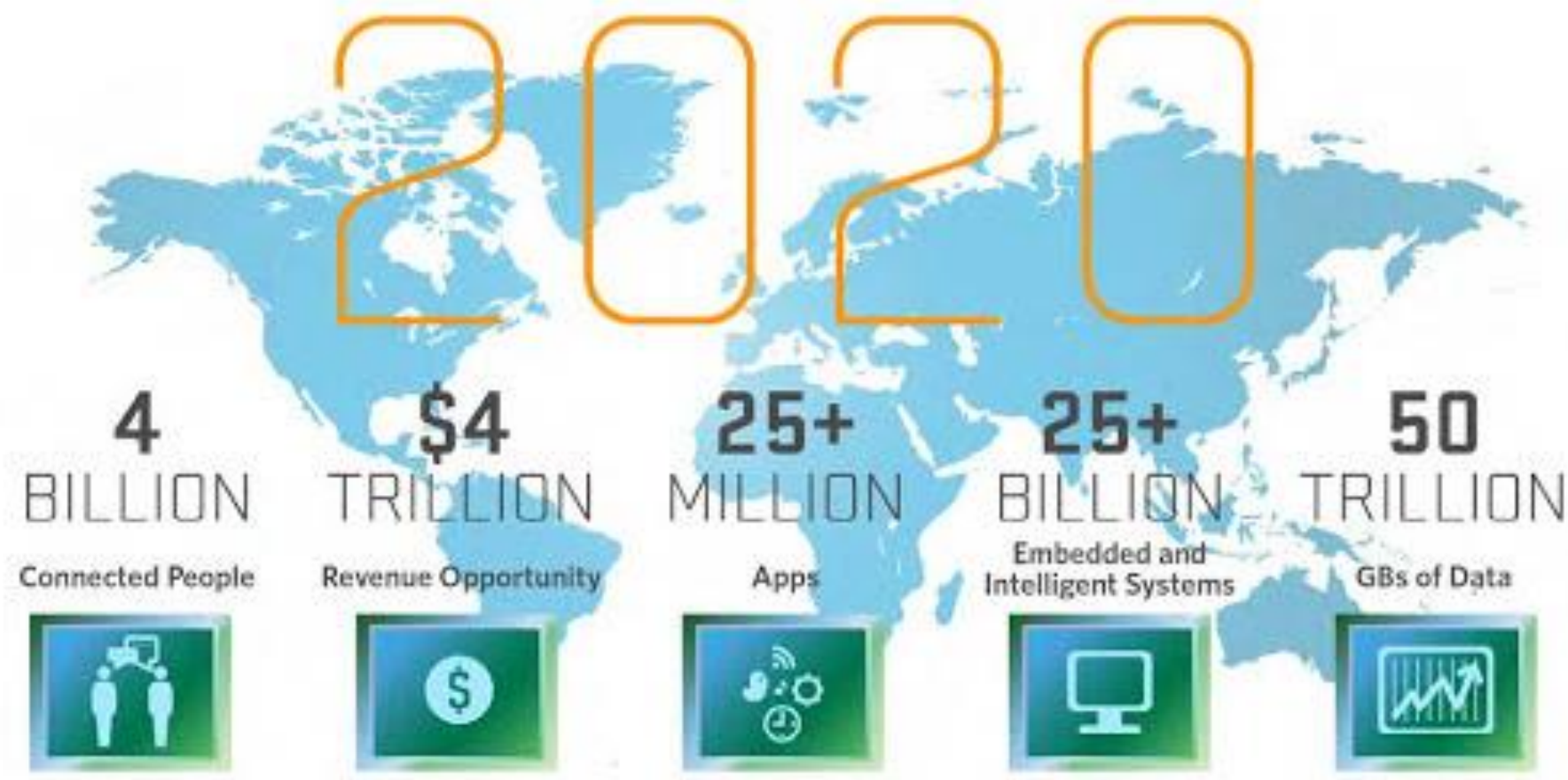
DIFFERENT FORMS
OF DATA SOURCES



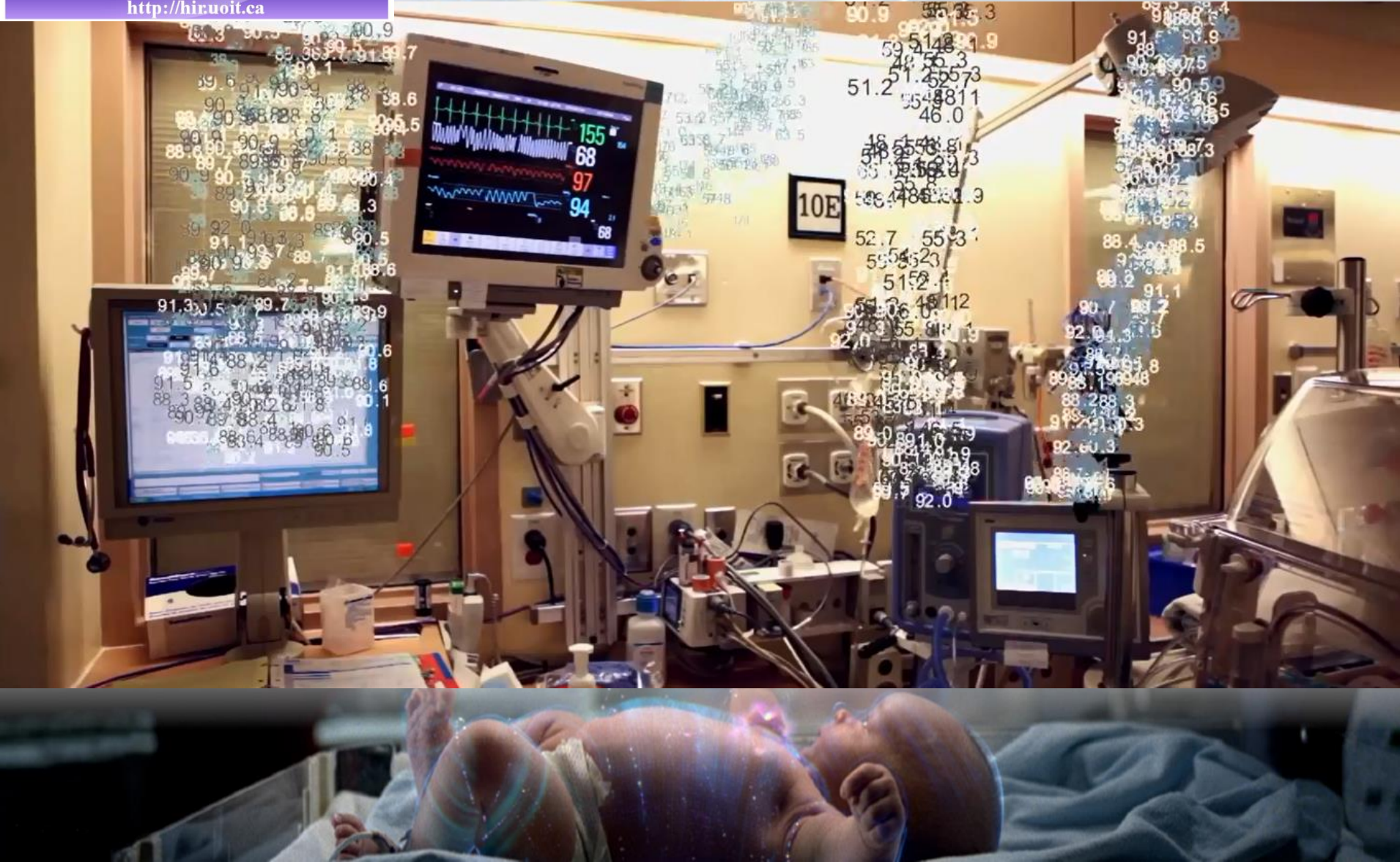
VERACITY

UNCERTAINTY OF
DATA

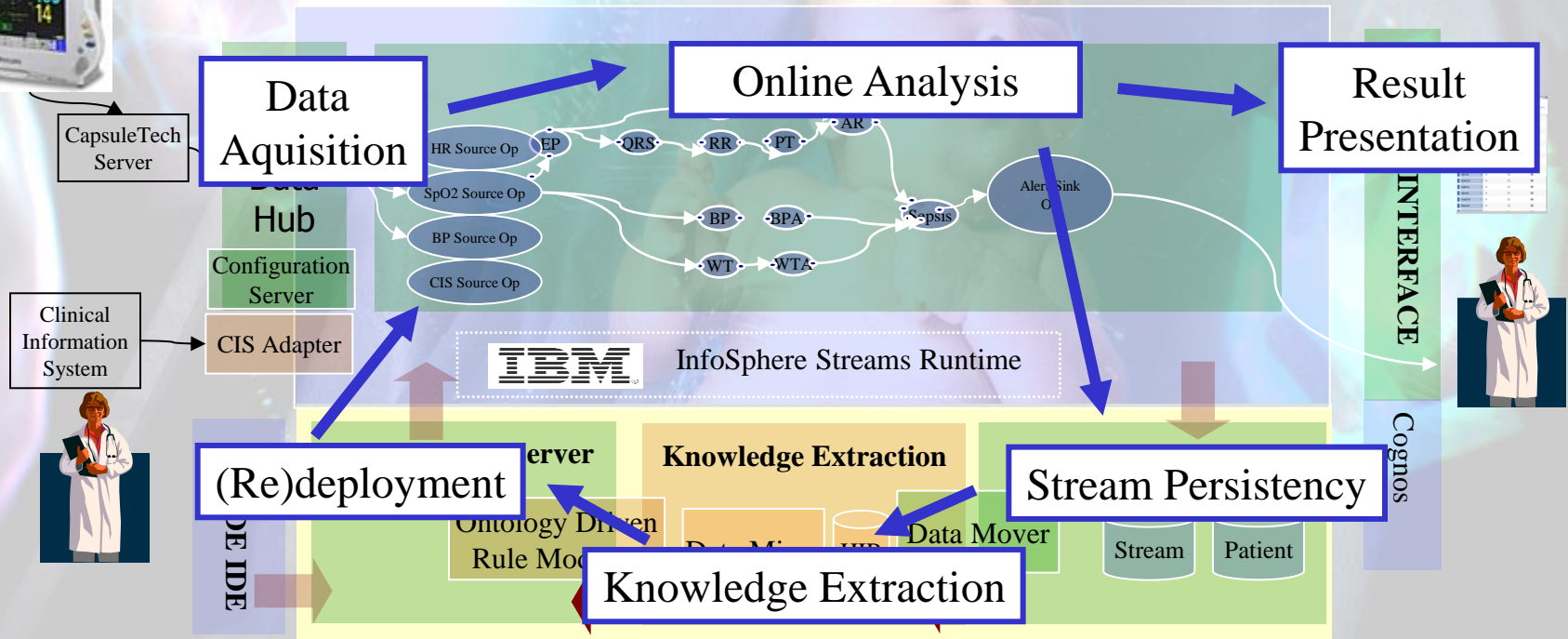
Internet of Things



Artemis



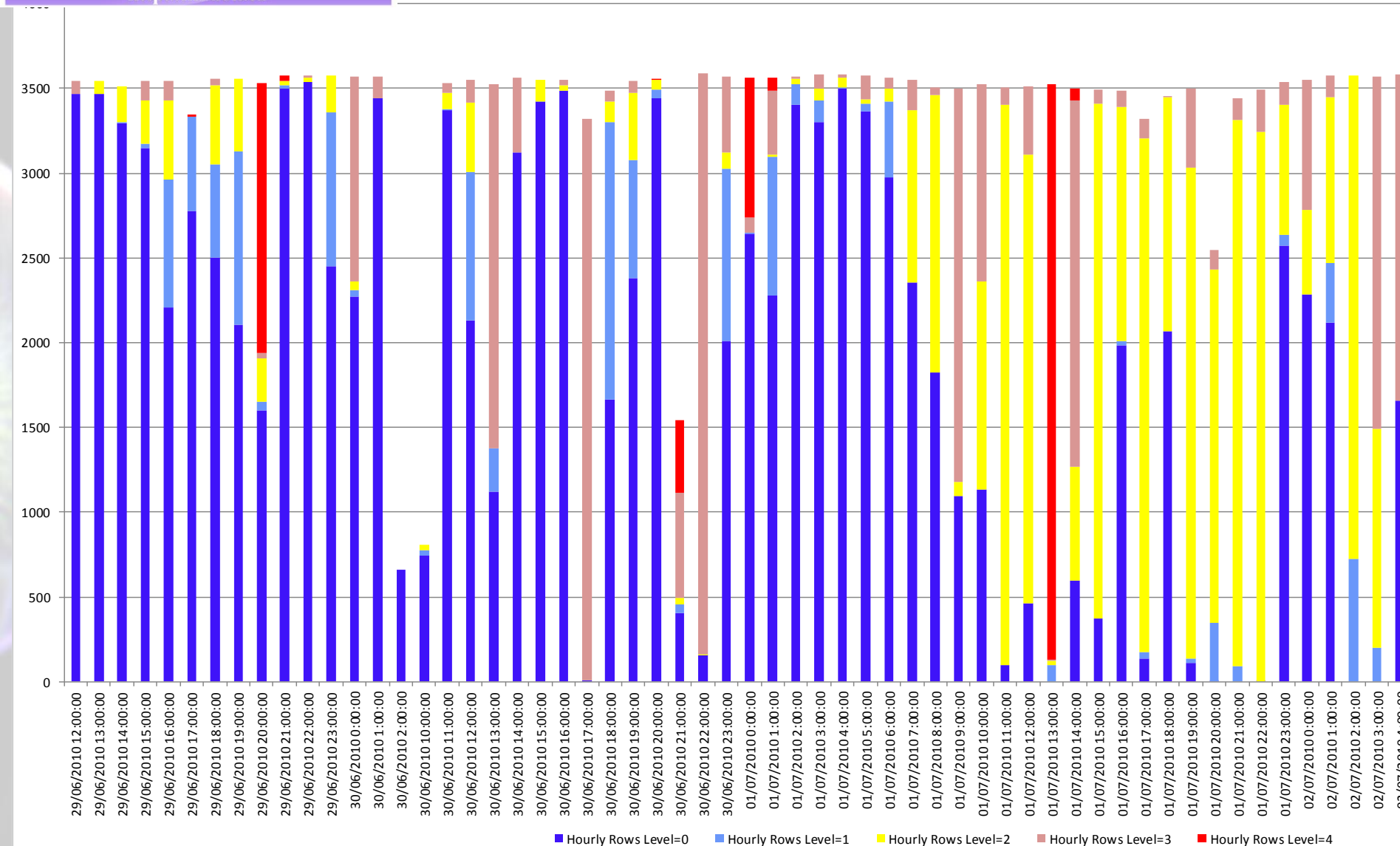
Artemis



Detecting Infection

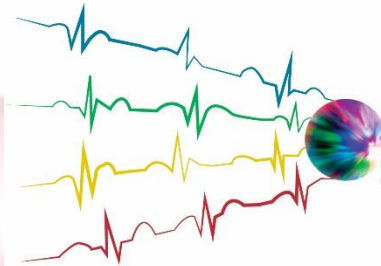
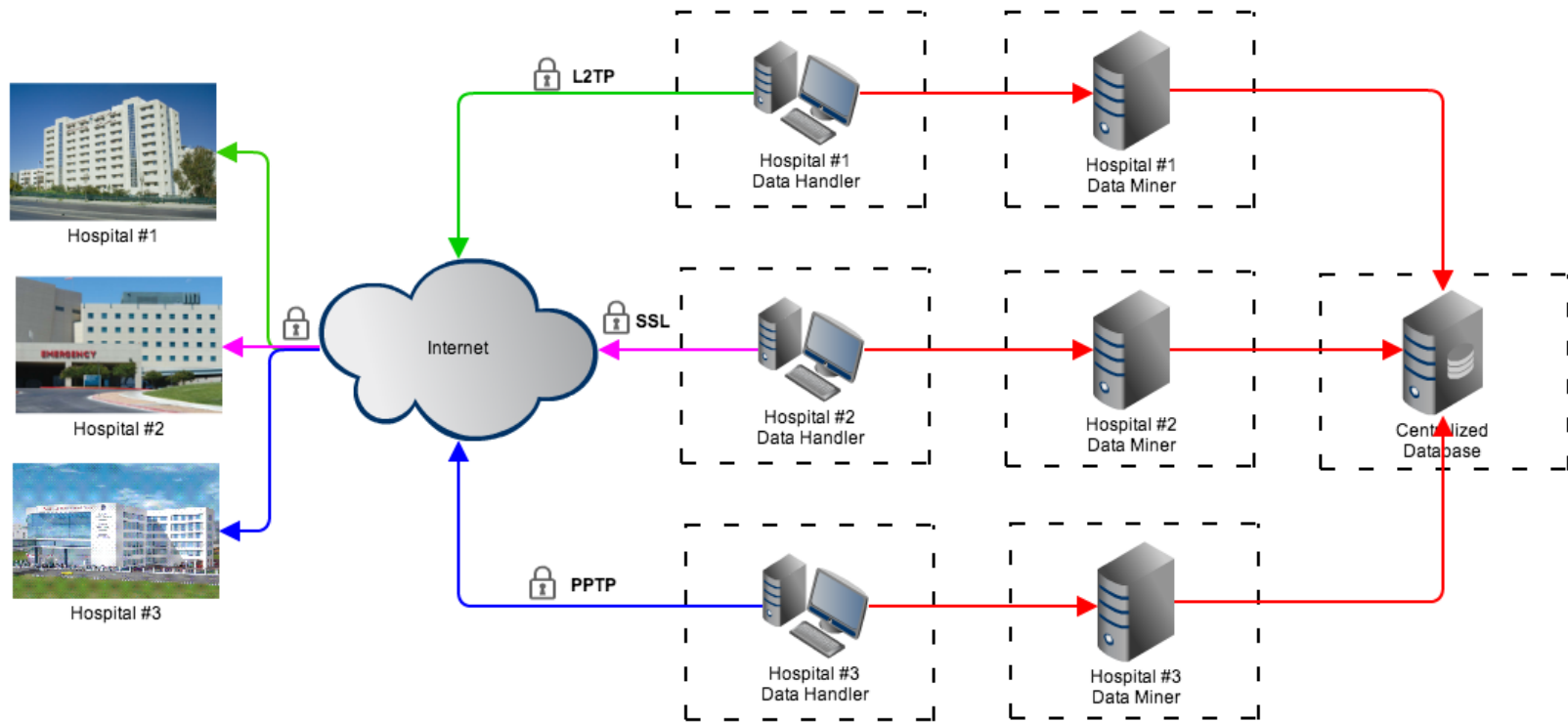


Late Onset Neonatal Sepsis (LONS)





Artemis Cloud Expansion



Artemis Clinical Applications



The Canadian Neonatal Network™
Le Réseau Néonatal Canadien™

Dependency or area of special sovereignty
Island / island group
Capital

Scale 1:35,000,000
Reference Projections
standard parallels 30°N and 30°S

SickKids



McMaster Children's Hospital

Women & Infants

WOMEN & INFANTS HOSPITAL OF RHODE ISLAND
A CARE NEW ENGLAND HOSPITAL



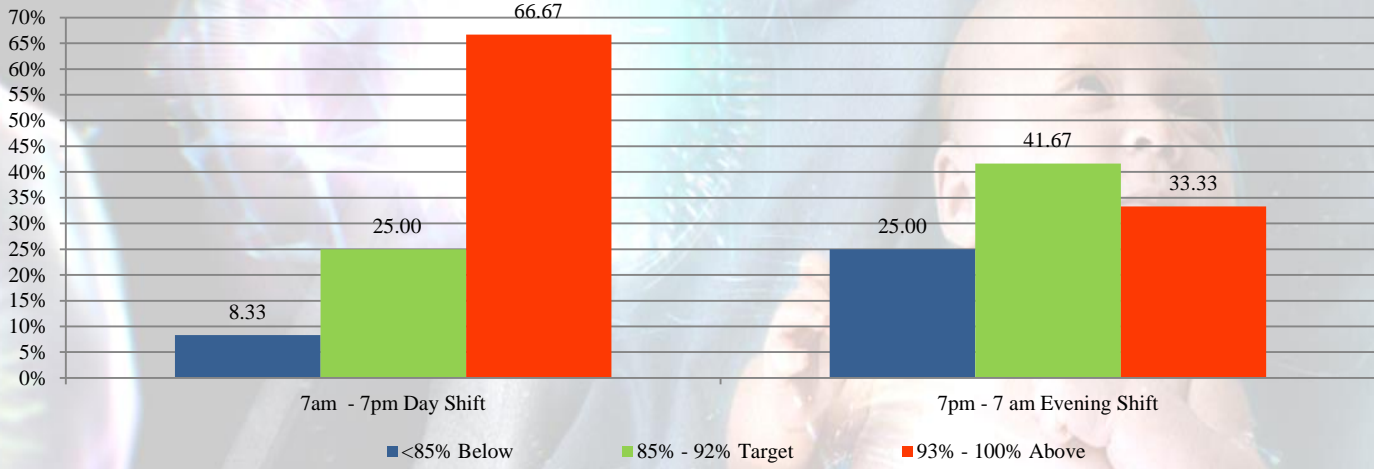
复旦大学附属儿科医院
CHILDREN'S HOSPITAL OF FUDAN UNIVERSITY



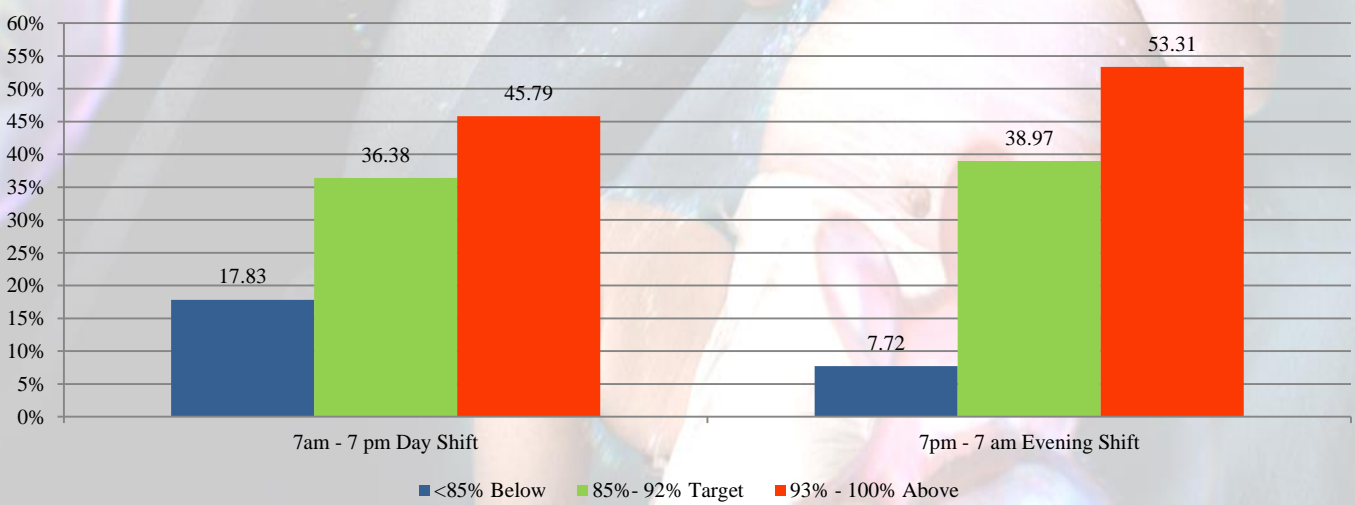
Oxygen Analytics



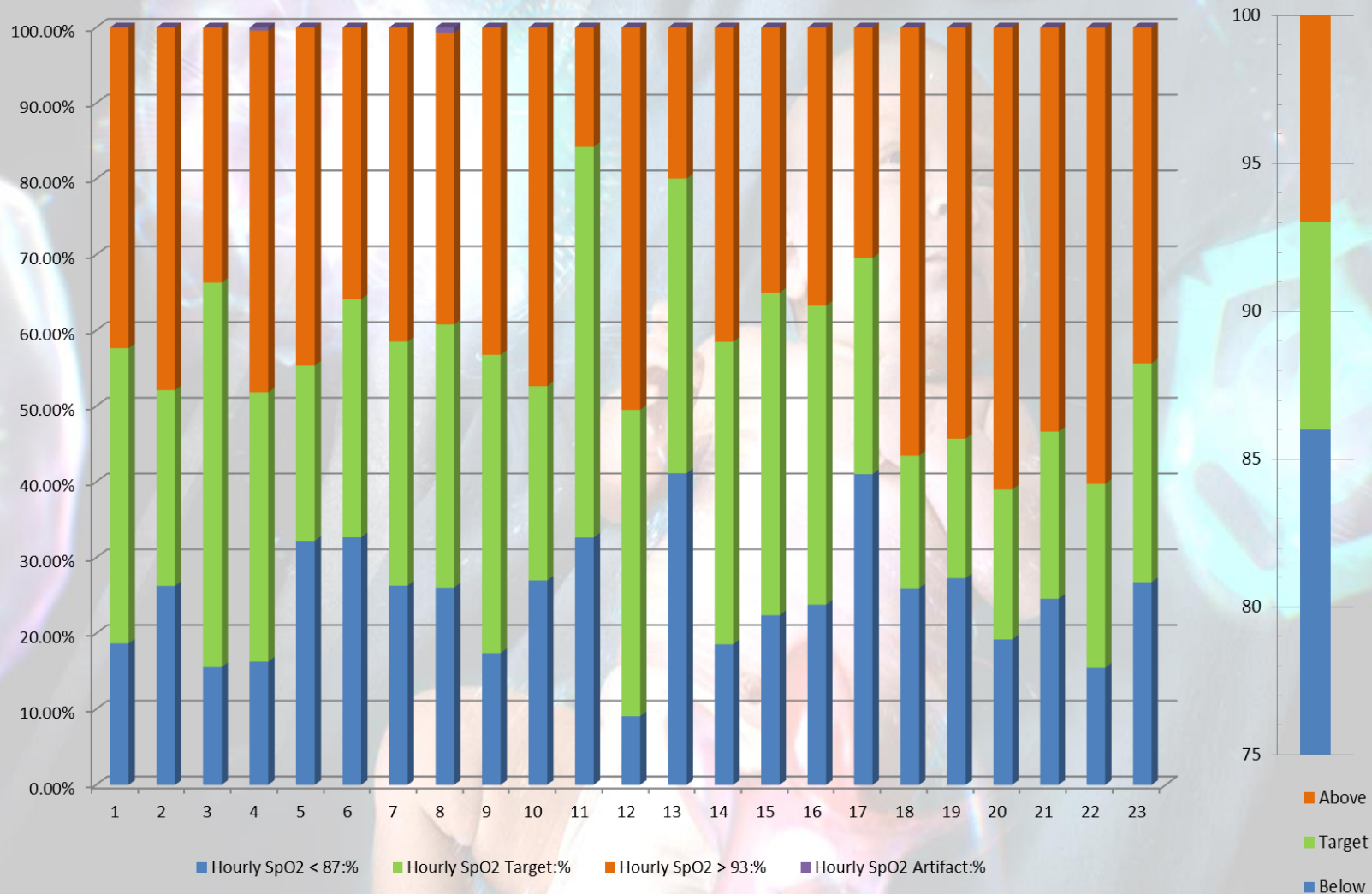
O₂ saturation percent frequency using top of the hour spot readings, day 28



O₂ saturation percent frequency using Artemis 1 Hz data collection, day 28

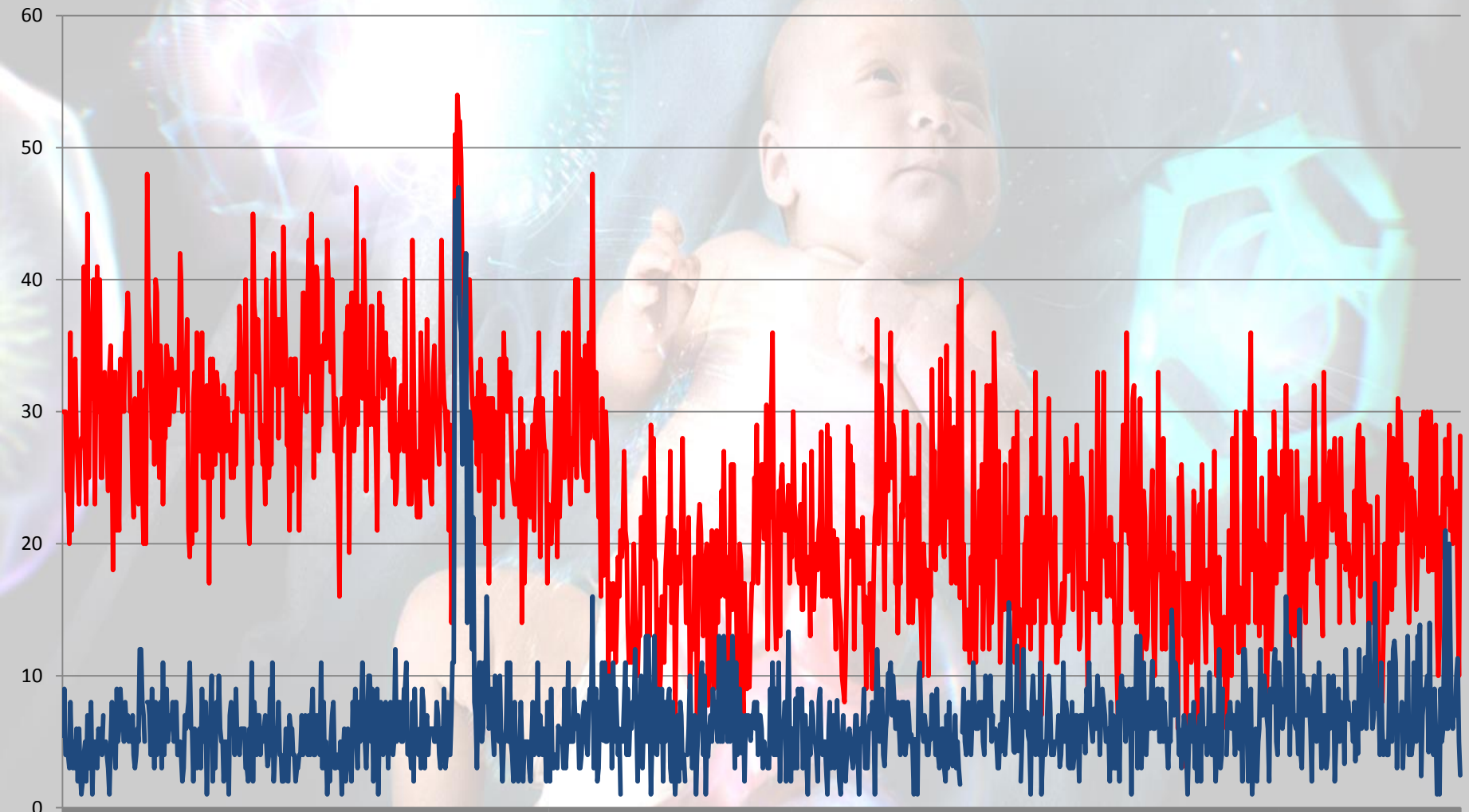


Oxygen Analytics

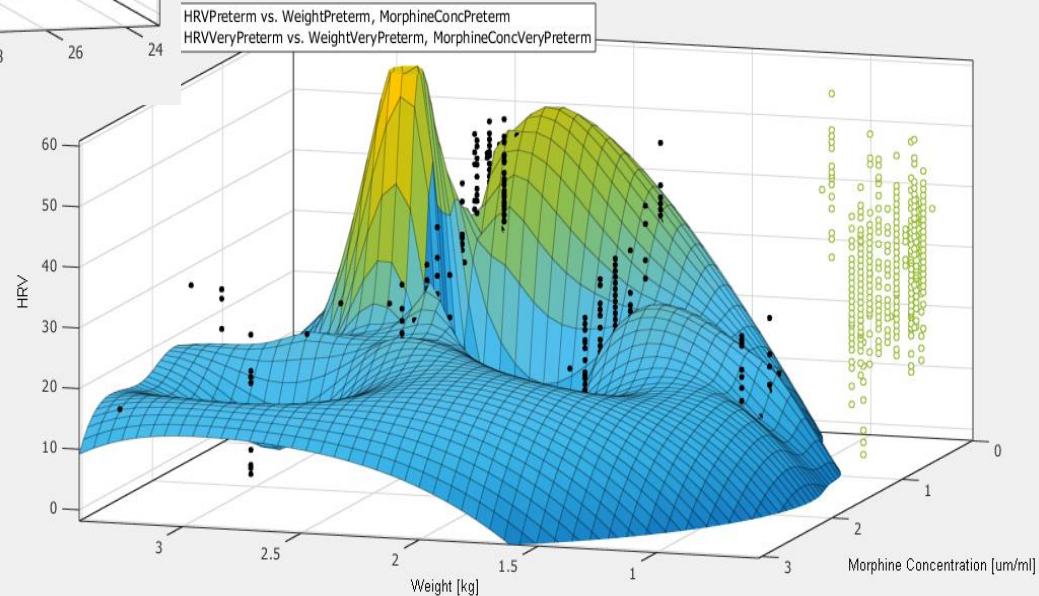
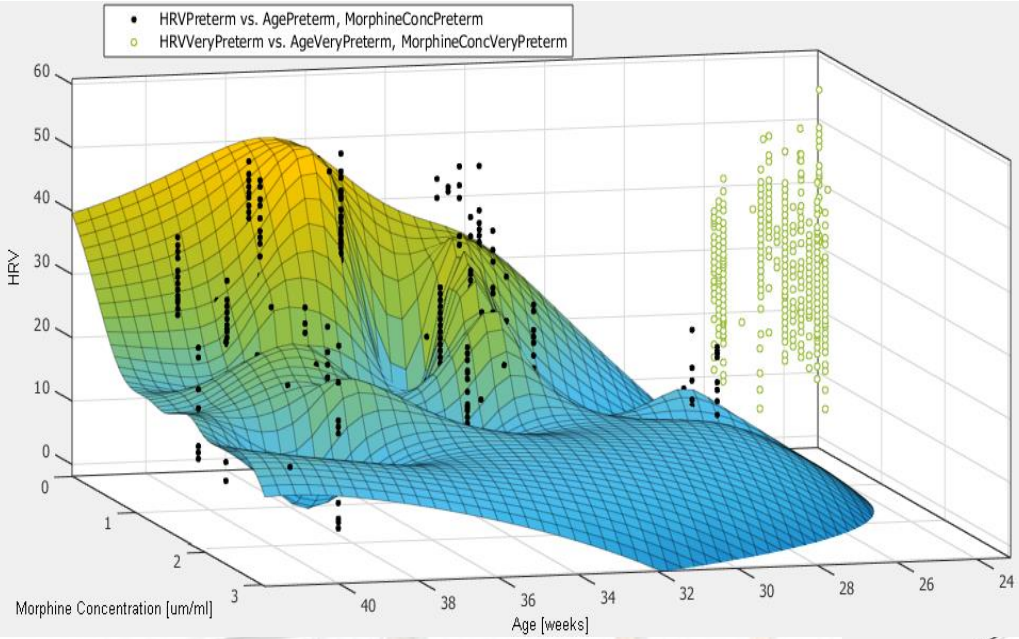


Anemia of Prematurity

— HR — RR



PK/PD Morphine



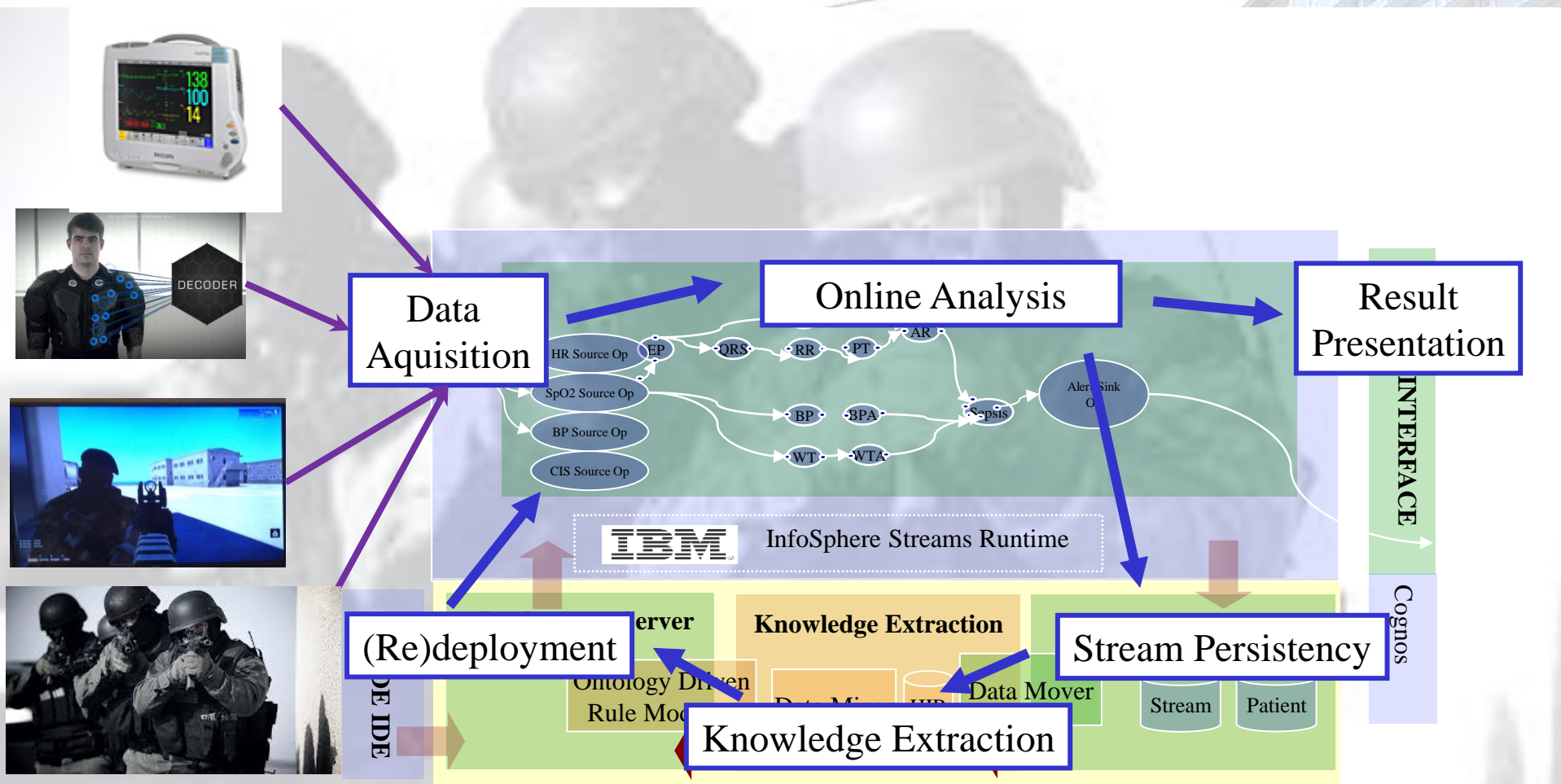
Implications for Clinical Engineering

- Medical Device Procurement
- Network Bandwidth
- Storage and Retention of Data
- Medical Device Connectivity
- Synchronisation with ADT
- Challenges with Infusion Pumps
- Integration of External patient and non patient data

Athena



Athena



- Healthcare Innovation is not a Magic Pill
 - Rigorous research
 - Linkages to outcomes
 - Scalability/Reliability/Resiliency
 - Policy Changes to Guidelines and Practices
 - Impact on Healthcare Organisations
 - Change Management for Integration into Care Practices
 - New Information Technology Strategic Architectures
 - Use of Data Governance

Twitter



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