



INTEGRATED MEDICINE AT UPMC: USING ICT TO DRIVE VALUE IN HEALTHCARE

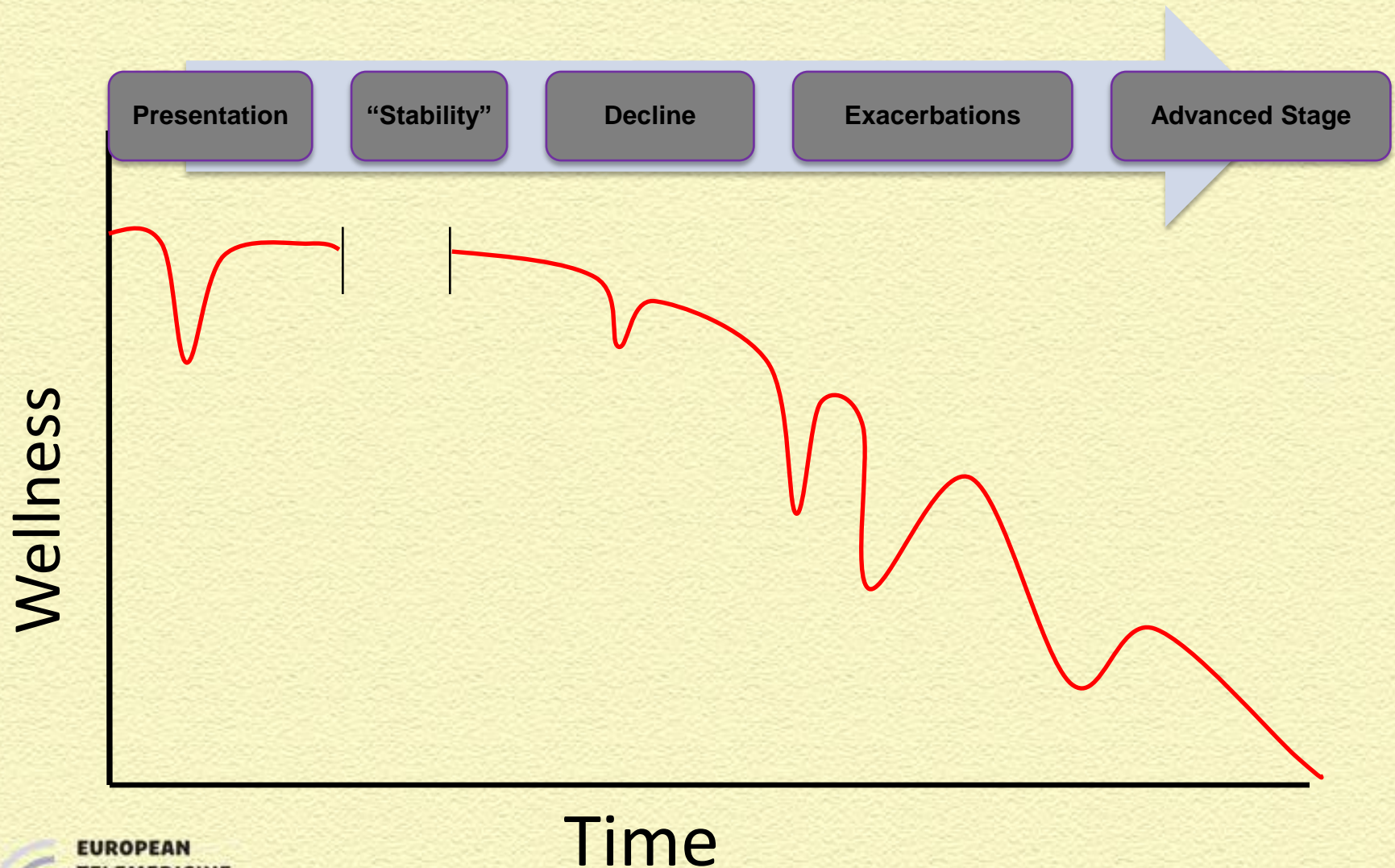
RAVI RAMANI, MD

*DIRECTOR, UPMC INTEGRATED HEART FAILURE
PROGRAM*

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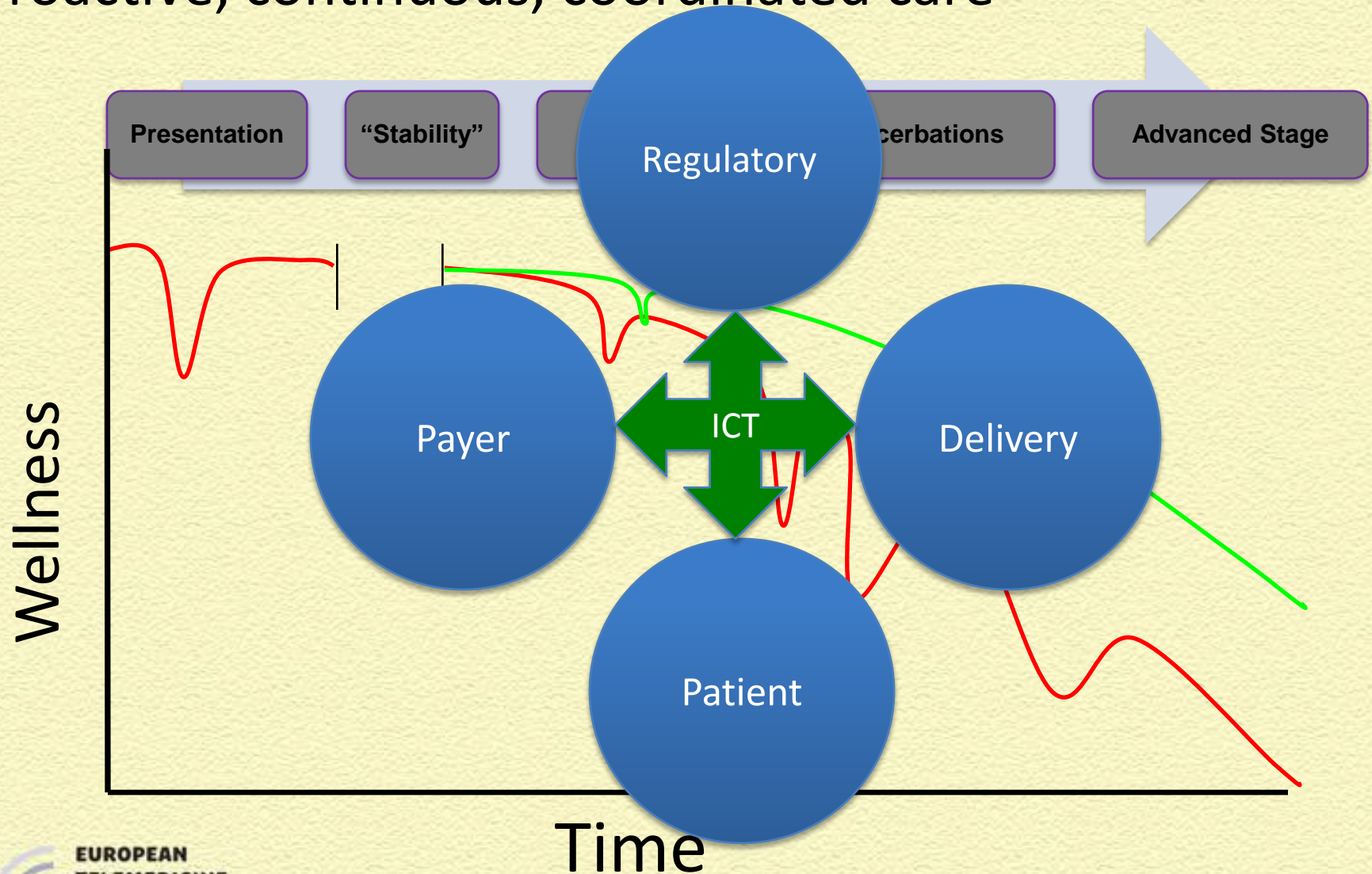
Heart Failure: Current Clinical Care

Uncoordinated, reactive, fragmented, expensive



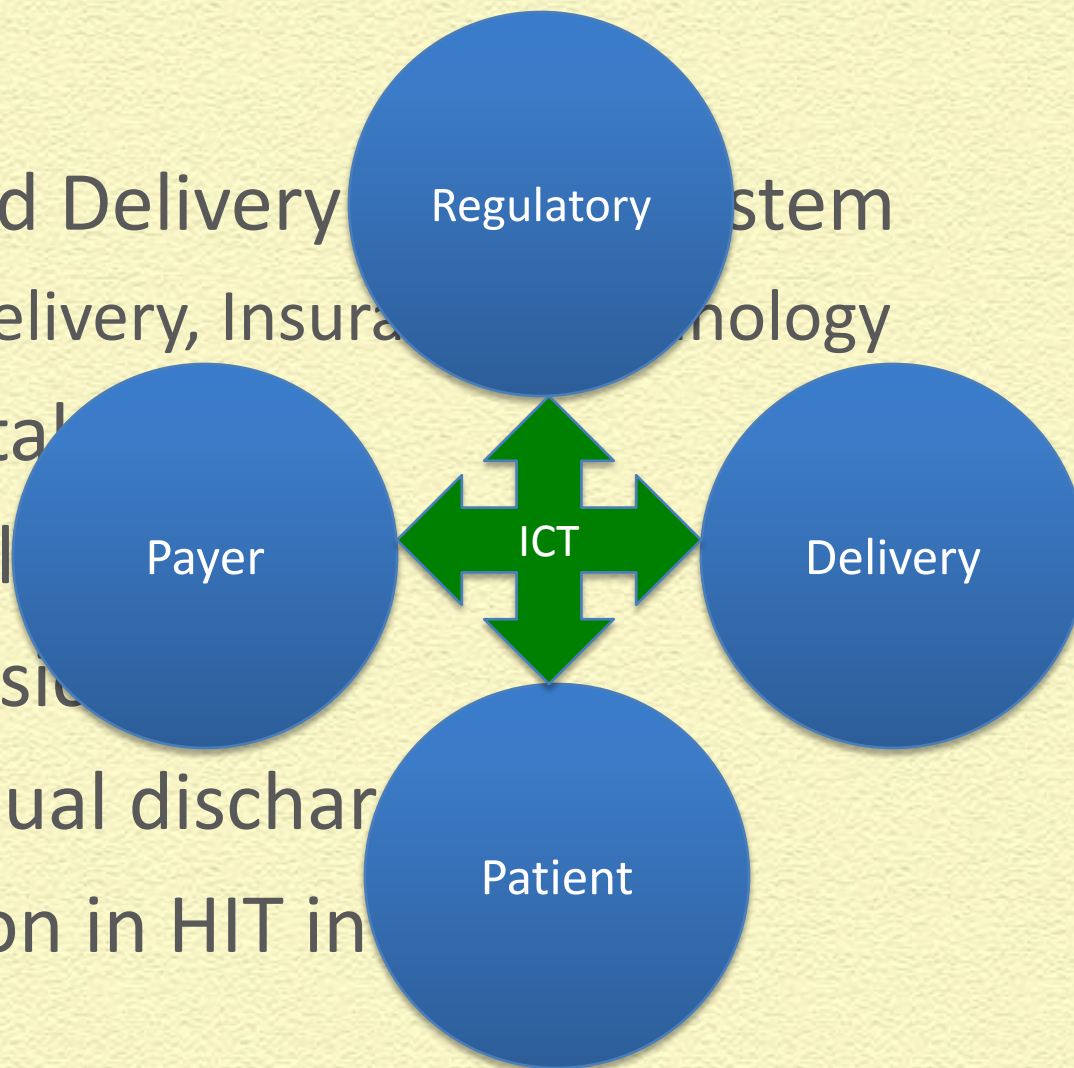
Goal for Heart Failure:

Proactive, continuous, coordinated care

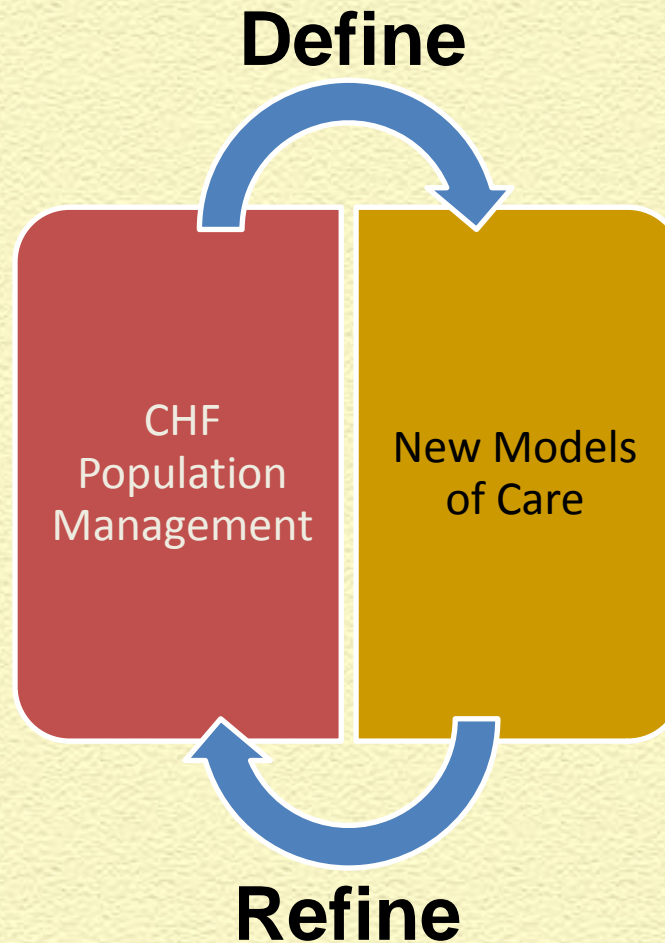


UPMC

- Integrated Delivery System
 - Care Delivery, Insurance, Technology
- 23 Hospitals
- 400 care lines
- 3500 physicians
- 4500 annual discharges
- \$2.1 billion in HIT in 2013

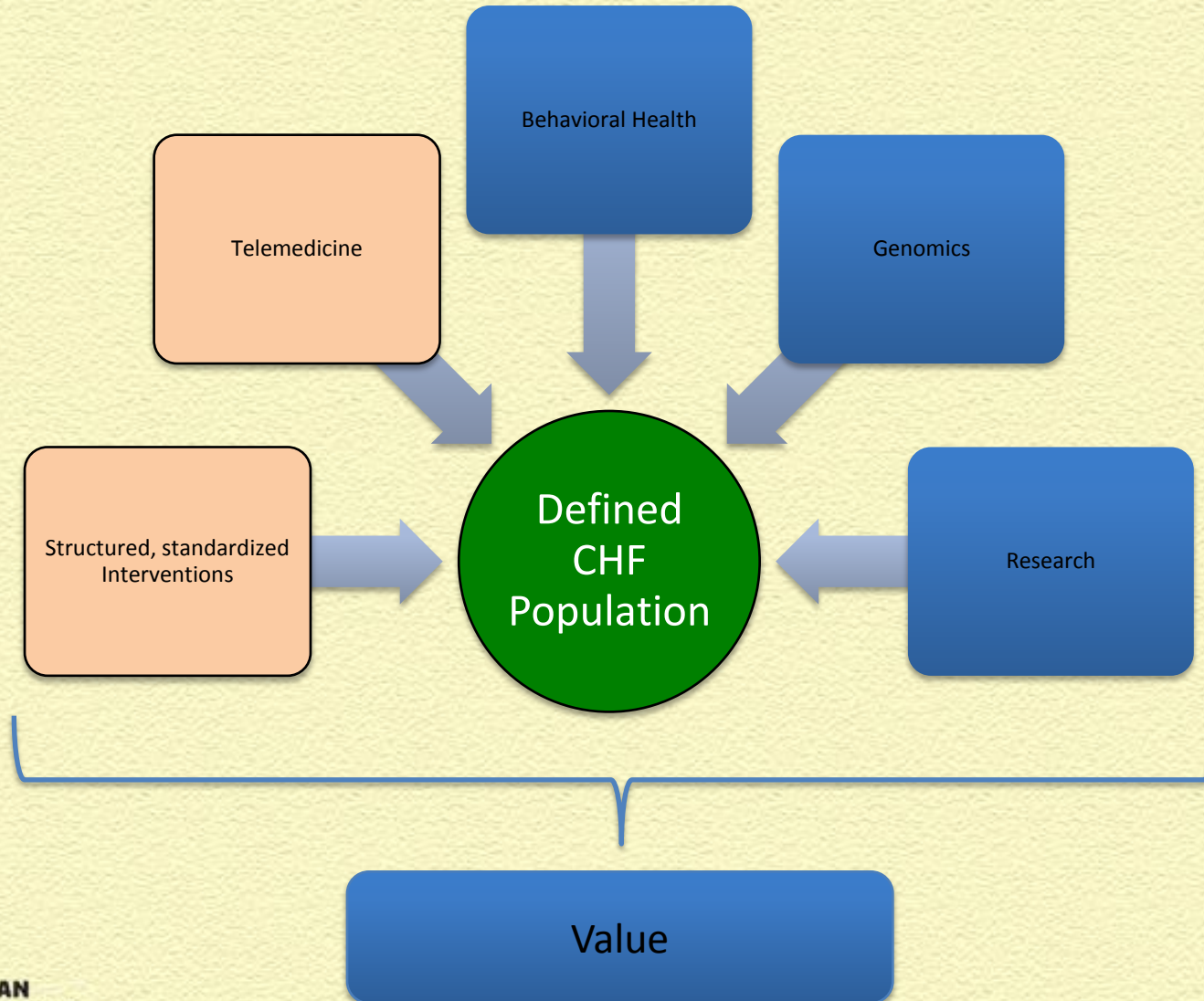


Overview

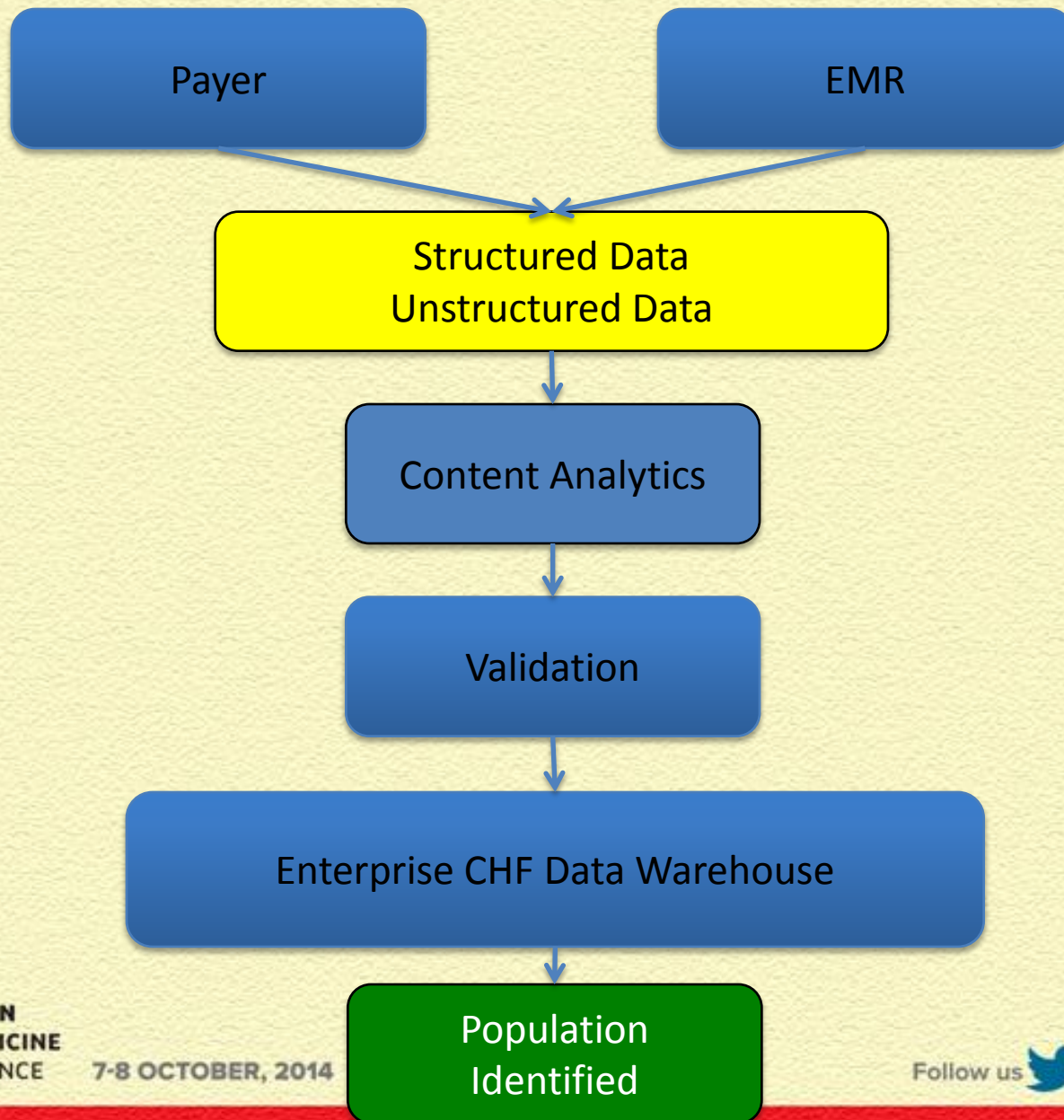


Core Principle: Structured Management of a Characterized Population

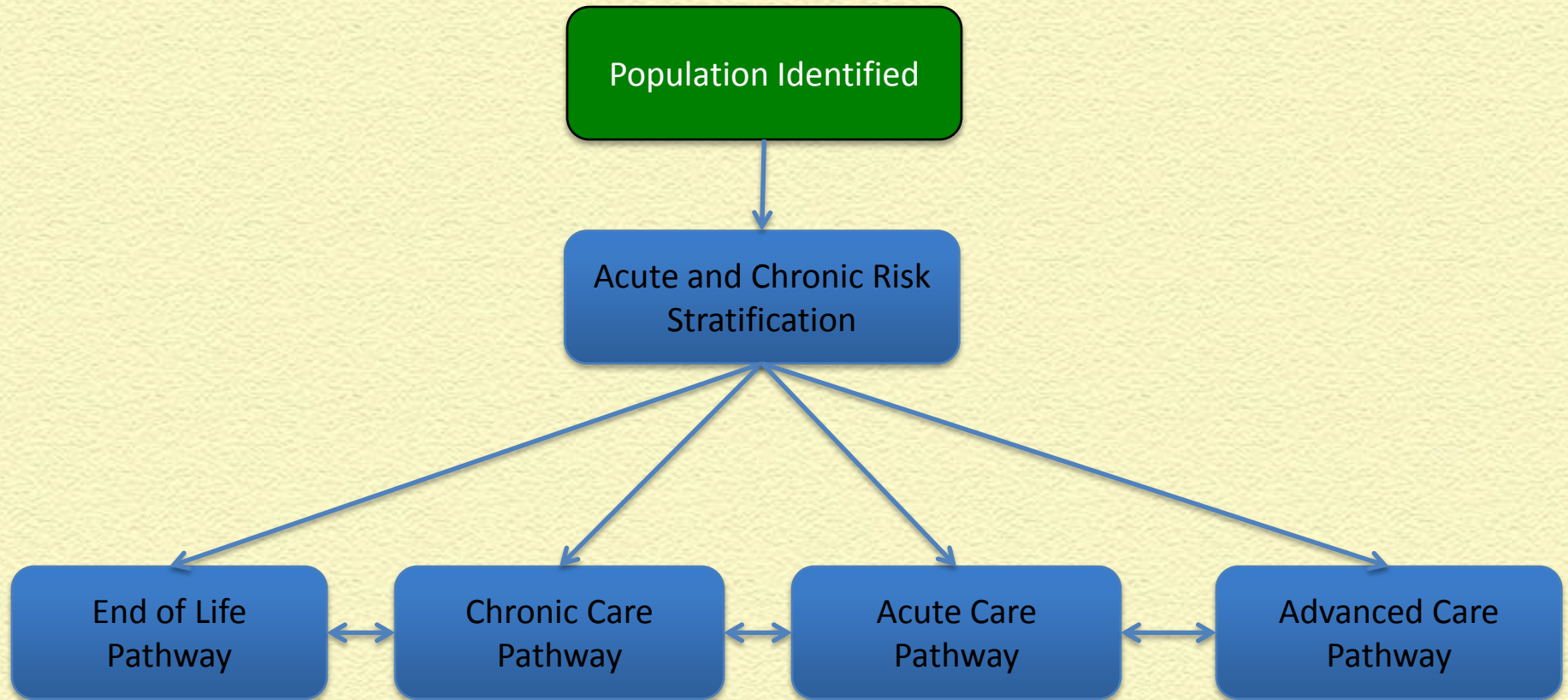
Opportunities For Delivering Value



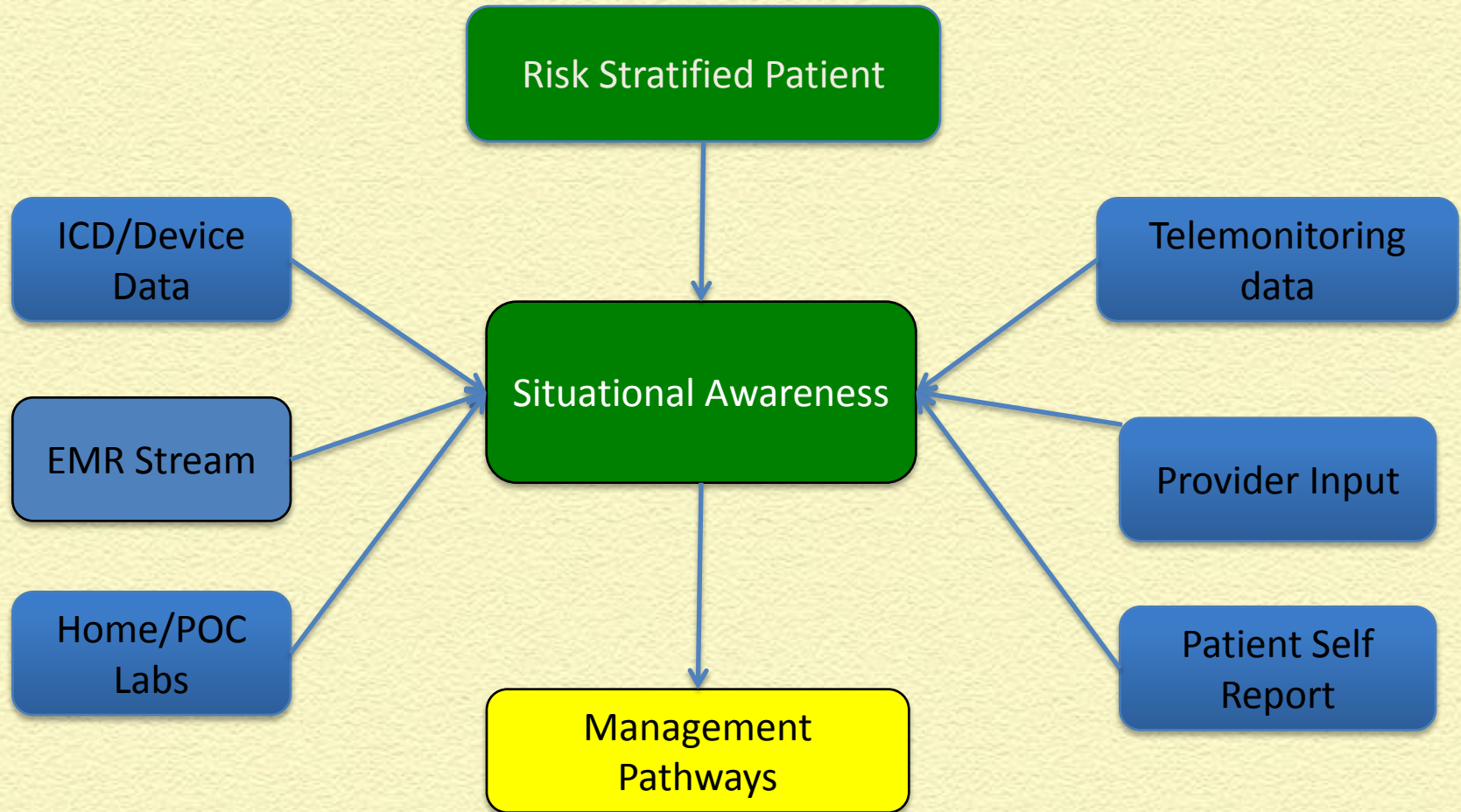
Identifying the CHF Population



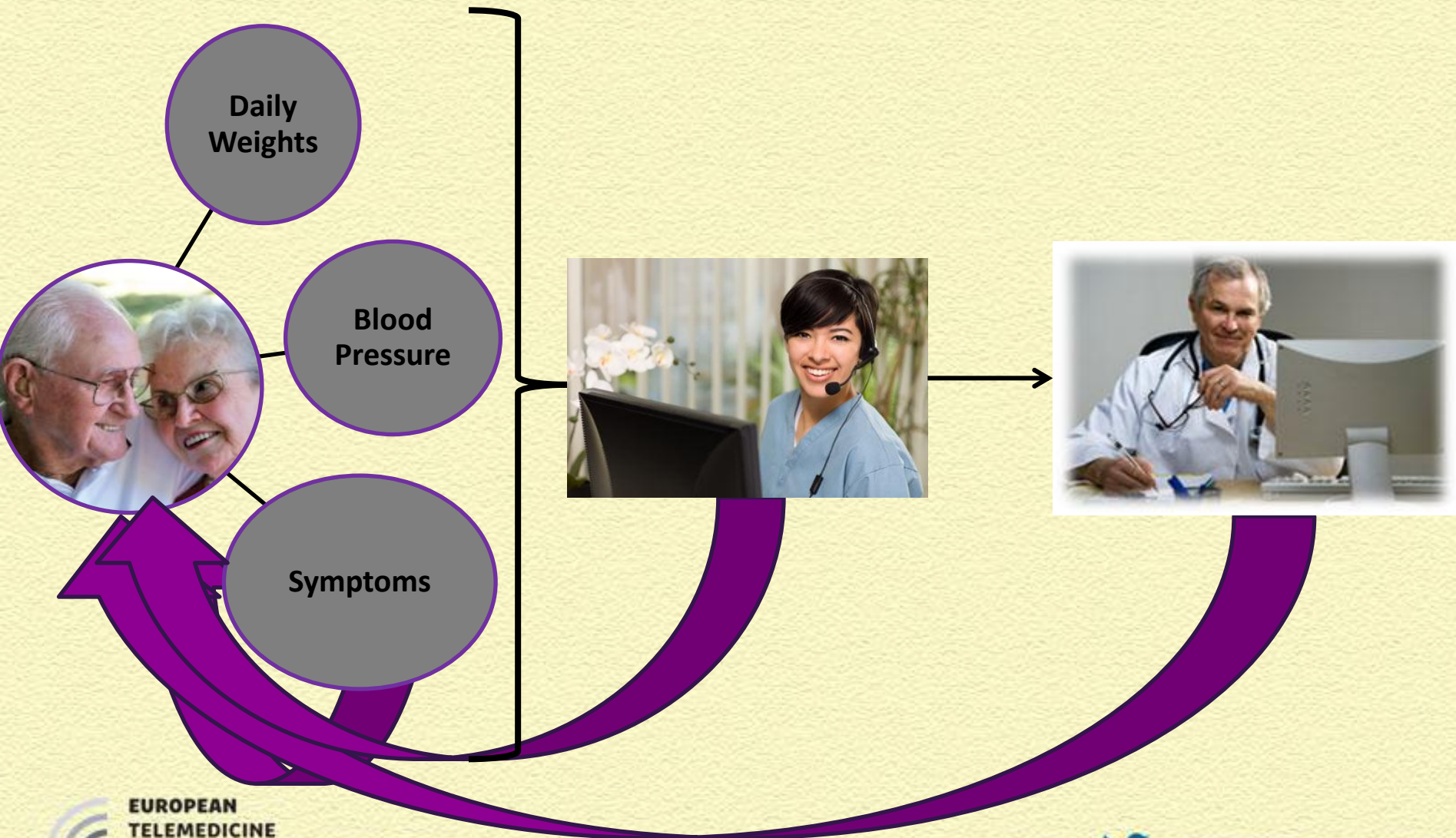
HF Population Pathway



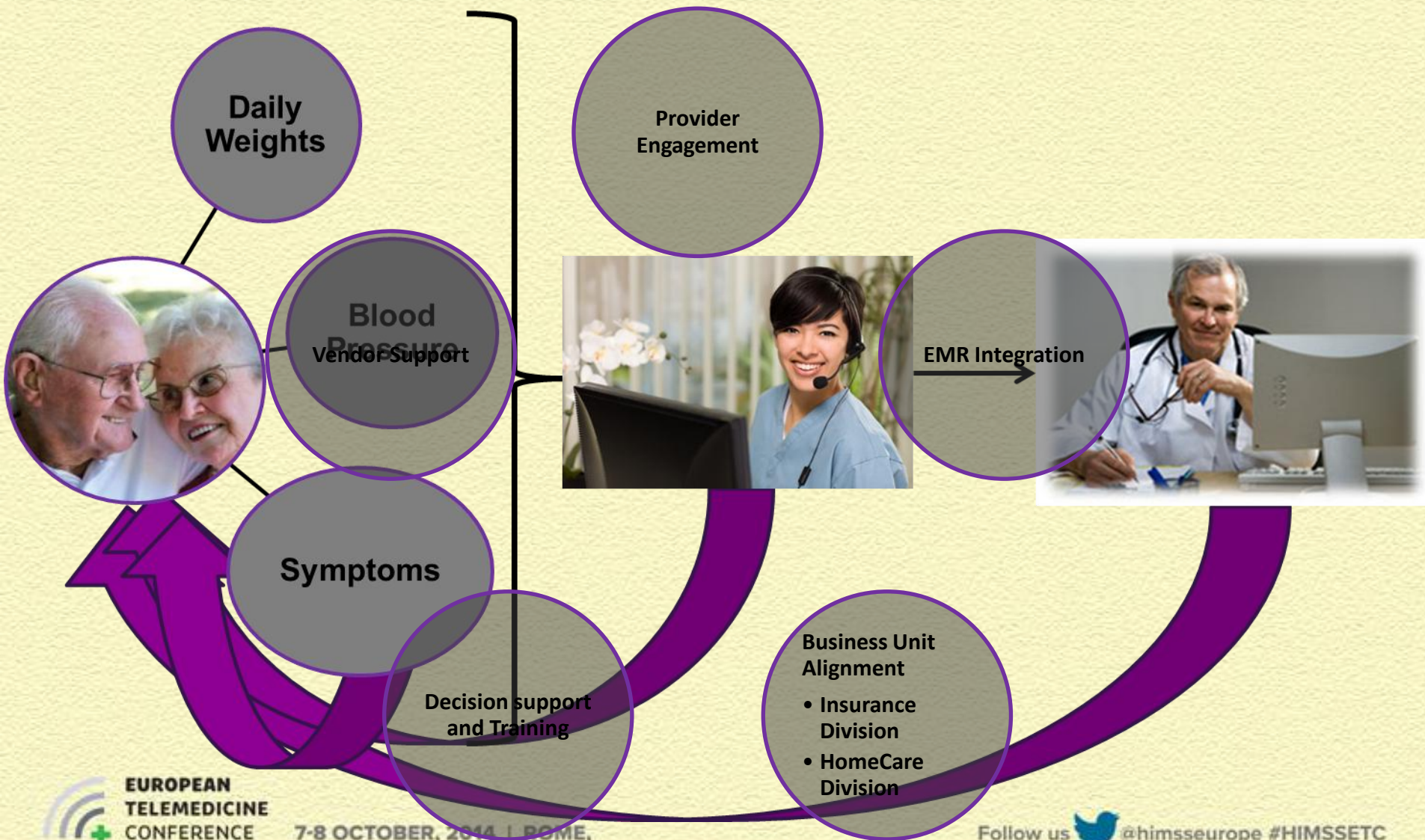
Real Time Management Inputs



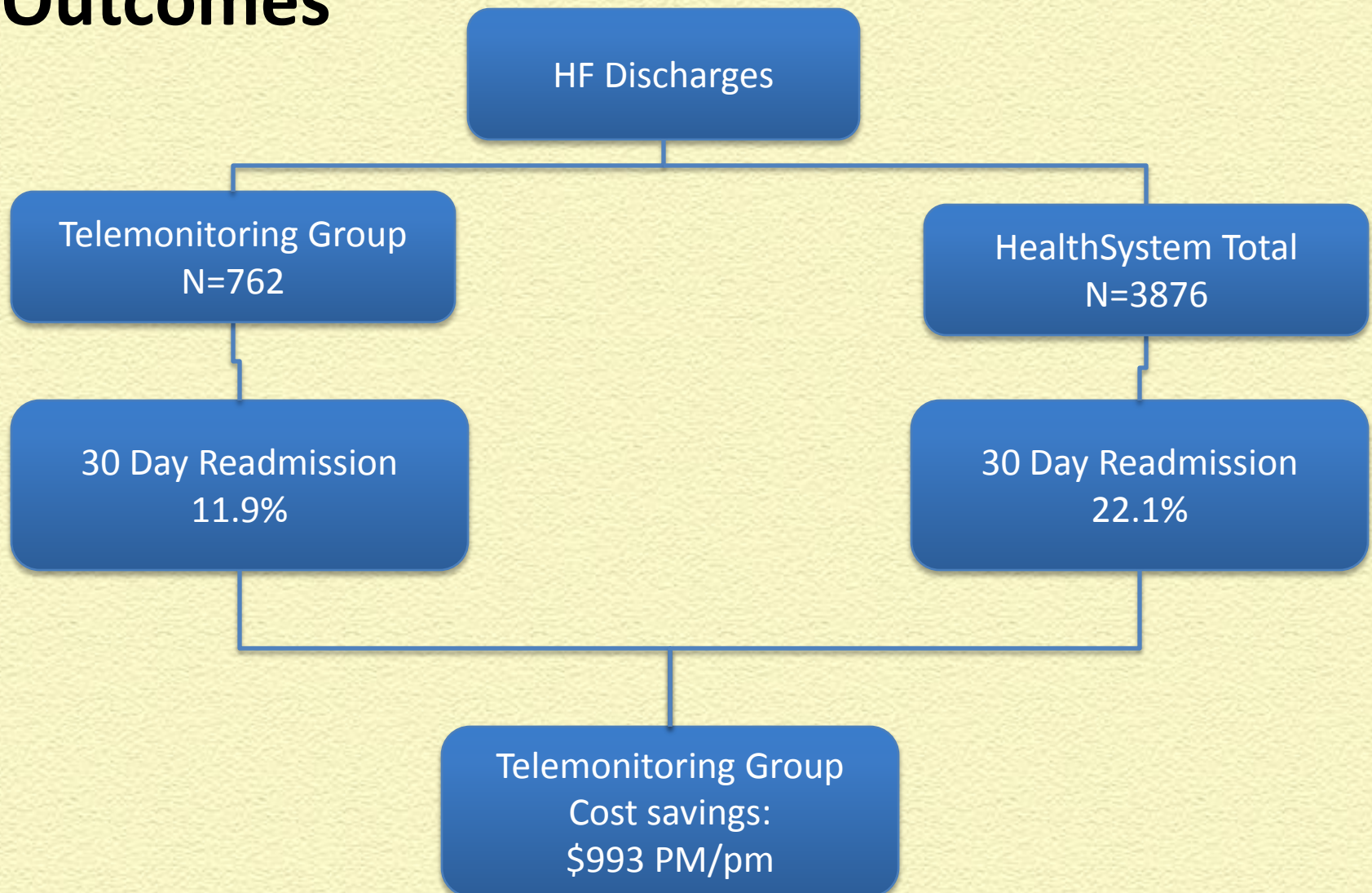
Remote Monitoring



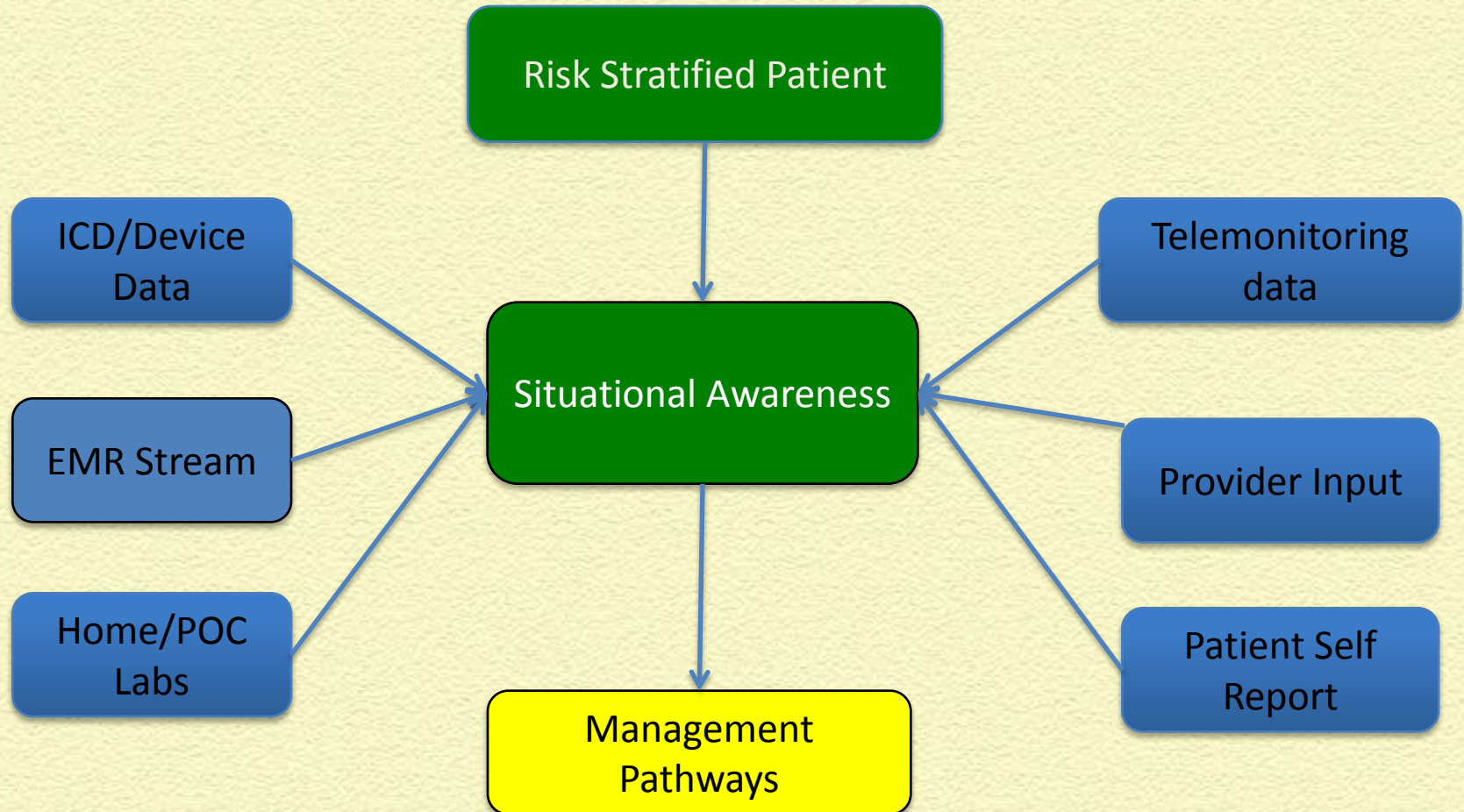
Remote Monitoring: Under the hood



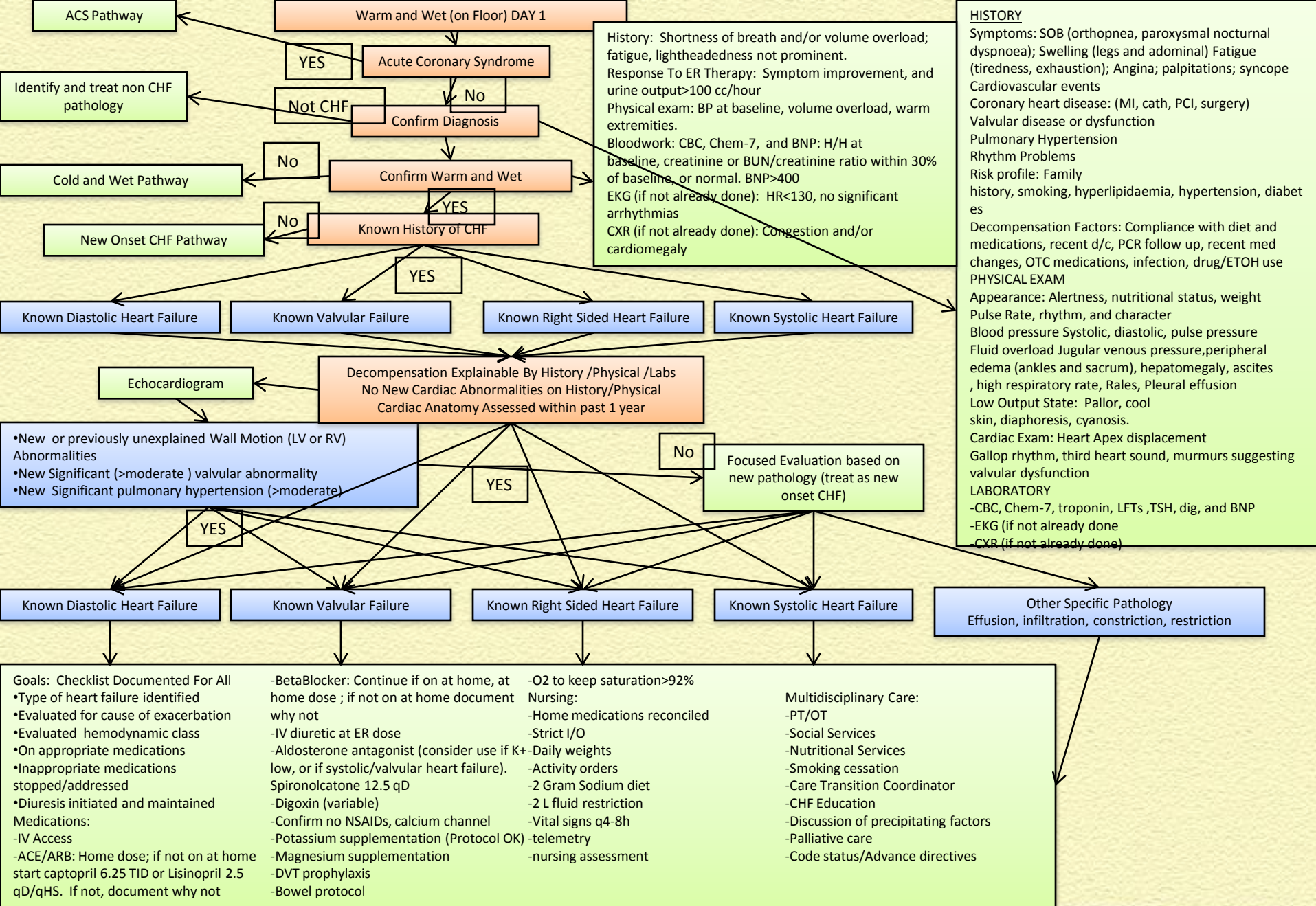
Outcomes



Management Inputs







Pathways: Clinician Interface



Smythe, John J. 64 Male African American

Acute on Chronic
Systolic Heart Failure



Hx

Admission

Pathway

Diagnostics

Type of Heart Failure: systolic, chronic ▾

Documented by Dr. Shivdev Rao on 7-Jul-2014

Cause of exacerbation: alcohol consumption ▾

Documented by Dr. Shivdev Rao on 7-Jul-2014

Hemodynamic class: warm and wet ▾

Documented by Dr. Shivdev Rao on 7-Jul-2014

Tests and Screens

Chest x-ray: recommended order now

Echocardiogram: not recommended order now

Device screen: not performed perform now

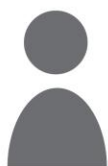
Standard of Care (90% Compliance)

- ☒ Allergies reviewed with patient
- ☒ Telemetric monitoring
- ☒ Vital Signs Q4H
- ☐ Strict I&O order now
- ☒ Daily Weights
- ☒ Low Sodium / Low Cholesterol Diet
- ☒ Fluid Restriction: 1500ml/24hrs ▾

Consults

- | | |
|----------------------|------------------------|
| Physical Therapy | request |
| Occupational Therapy | request |
| Smoking Cessation | requested |
| Nutritional Services | request |
| Care Transition | request |

Pathways: Decision Support



Smythe, John J. 64 Male African American

Acute on Chronic
Systolic Heart Failure



Hx

Admission

Pathway

Euolemia

Is the patient euolemic?
☐ Yes ☒ No [See Facts](#)

Cardiac Output

Does the patient have
low cardiac output?
☐ Yes ☒ No [See Facts](#)

Baseline Creatinine

- 1.5 + [See Graph](#)

Diuresis for 15 July

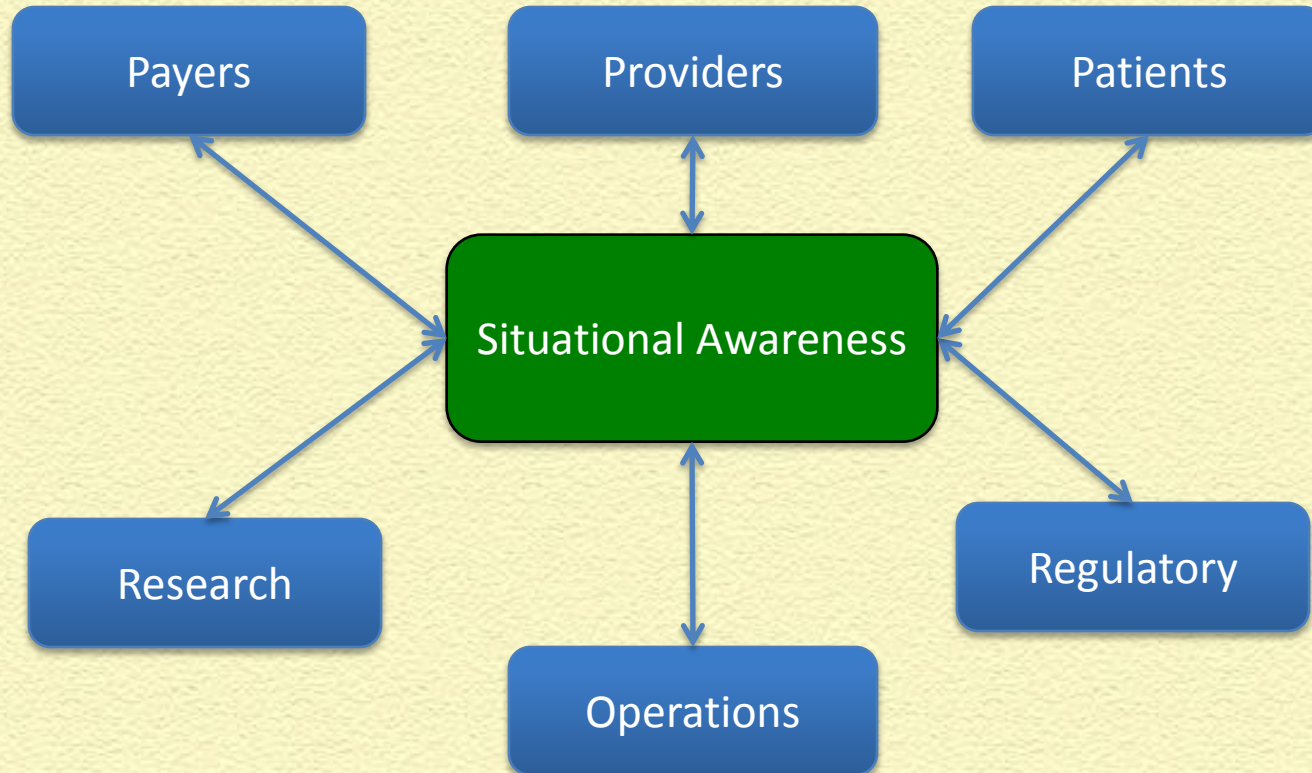
- ☒ Double Diurectic Dose
↑3 ↓0 [Evidence](#)
- ☐ Continue Current Dose
↑1 ↓3 [Evidence](#)
- ☐ Add Zarox 2.5mg
↑1 ↓3 [Evidence](#)
[Additional Options](#)

Medications

- ACE/ARB
 - ☒ Discontinue Lisinopril
[Additional Options](#)
- Beta Blocker
 - ☒ Reassess pre-discharge
[Additional Options](#)
- Aldosterone Antagonist
 - ☒ Start Spironolactone 25mg
[Additional Options](#)

Order and Document

Pathways: Data Sharing



Lessons Learnt (Still Learning.....)

Engage
Stakeholders
(What)

Identify
appropriate
target
population
(Who)

Leverage ICT
to develop
workflow
optimized
Pathways
(How)

Refine with
stakeholder
input
(Rinse and
repeat)