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# SEPSIS – FROM A SAFETY-II PERSPECTIVE



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# Sepsis – a big worry?

BBC



NEWS

3 August 2018

**Sepsis deaths recorded in England's hospitals have risen by more than a third in two years, according to data collected by a leading safety expert.**

In the year ending April 2017, there were 15,722 deaths in hospital or within 30 days of discharge, where sepsis was the leading cause.

Prof Sir Brian Jarman believes staff shortages and overcrowding on wards are partly to blame.

*“In reality [there] is an increased awareness and detection of sepsis and an actual reduction in mortality [rates] in hospital and in the first 30 days after discharge from sepsis.” Bryan Williams (University College London)*

*“We can't be certain how much of the apparent rise is due to coding differences, as coding is inconsistent and we have no national disease register.”*

*Ron Daniels (Chief Executive of the Sepsis Trust)*

# Sepsis detection (Safety-I)

## ALGORITHM FOR THE MODIFIED ST. JOHN RULE

- Defining the measurements, clinical thresholds and lookback time periods for Modified St. John Rule

```

grouperlist=c("Base Excess", "Bilirubin", "Blood Glucose Level", "Blood Creatinine", "GCS",
"Heart Rate/Pulse Rate", "Blood Lactate", "Mean Blood Pressure", "Resp Rate", "Blood Pressure Systolic", "O2 Saturation", "Temperature", "White Blood Cell Count")
c_varlist=c(12,6,9,13,3,7,8,2,4,10)
varlist_red=c(10,7)
varlist_yellow_l=c(12,6,9,13,3,7,8,2,4,10)
varlist_yellow_u=c(12,13,3,2)
timegap=c(30,30,30,1800,1800,720,1800,1800,4320,0)
threshold_red=c(90,4)
#Defining threshold Lower Limits and upper Limits for some measurements
threshold_yellow_l=c(36,95,22,4,7.8,2,65,34.2,44.2,90)
threshold_yellow_u=c(38.5,12,11.1,171)
    
```

Grouper codes 1: Base excess 2: Bilirubin 3: Blood glucose 4: Creatinine 5: GCS 6: HR 7: Lactate 8: MAP 9: RR 10: SBP 11: SpO2 12: Temperature 13: WBC

- Importing the measurement dataset

```
Sepsis_subdata=long_inhie
```

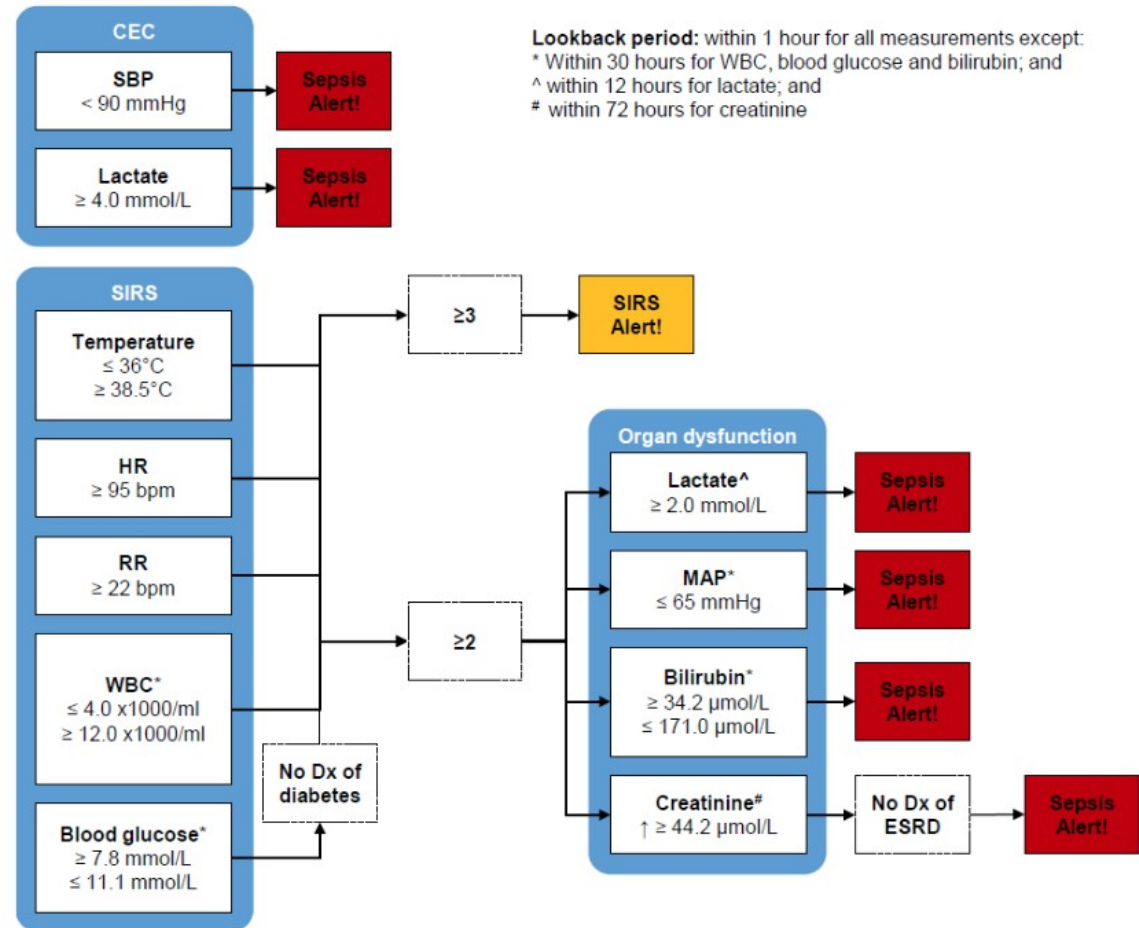
- Defining common variable names for critical variables & identifying column indices of those variables

```

colnames(Sepsis_subdata)[1]="Patient_Id" col_index_ID=which(colnames(Sepsis_subdata)==
"Patient_Id")
colnames(Sepsis_subdata)[11]="Dt_Tm_triggered" col_index_DT=which(colnames(Sepsis_subdata)
=="Dt_Tm_triggered")
colnames(Sepsis_subdata)[12]="Grouper" col_index_Grouper=which(colnames(Sepsis_subdata)
=="Grouper")
colnames(Sepsis_subdata)[16]="Result" col_index_Results=which(colnames(Sepsis_subdata)=
"Result")
    
```

From a Safety-I perspective, the detection of sepsis is a linear (algorithmic) process.

FIGURE 4.3: FLOW DIAGRAM FOR THE MODIFIED ST. JOHN SEPSIS RULE

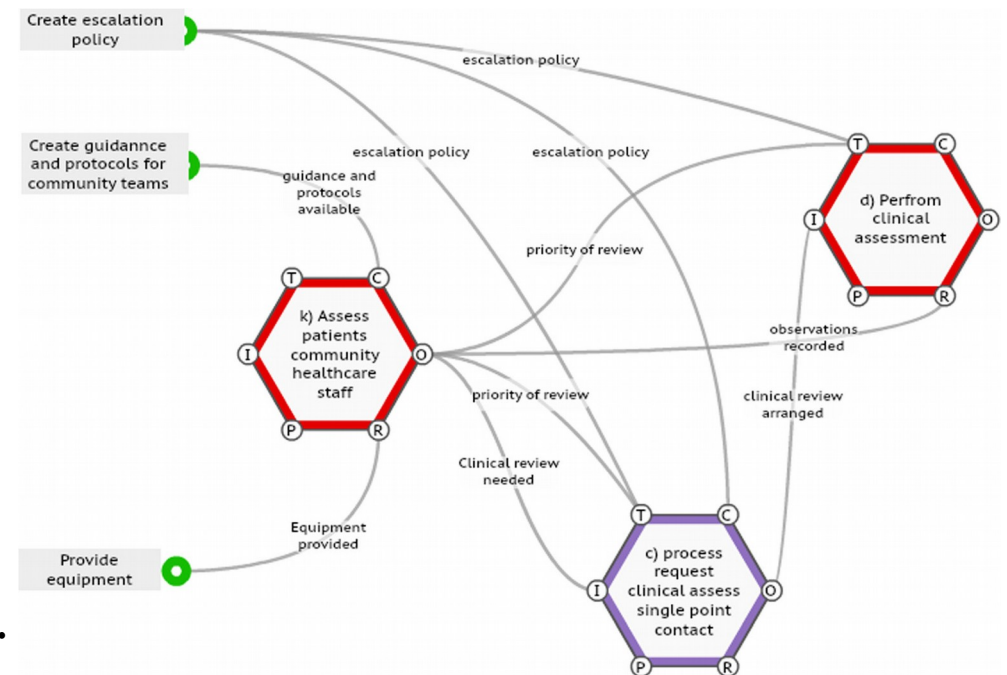


# Sepsis detection (Safety-II)

McNab et al., (2018). Participatory design of an improvement intervention for the primary care management of possible sepsis using the Functional Resonance Analysis Method. BMC Medicine (2018) 16:174

*Traditional improvement approaches often focus on individual performance or a specific care process, rather than seeking to understand and improve overall performance in a complex system. The construction of the FRAM model facilitated **an understanding of the complexity of interactions** within the current system, **how system conditions influence everyday sepsis management** and **how proposed interventions would work within the context of the current system.***

*This directed the design of a multi-component improvement intervention **that organisations could locally adapt and implement** with the aim of improving overall system functioning and performance to improve sepsis management.*



# Who imagines “work-as-done”?

Roland *BMC Medicine* (2018) 16:213  
<https://doi.org/10.1186/s12916-018-1212-6>

BMC Medicine

Open Access

COMMENTARY



## Guideline developers are not the only experts: Utilising the FRAM method in sepsis pathways

For sepsis, FRAM highlighted **the potentially unrealised gap** between ‘work as imagined’ and ‘work as done’. However, there are other disease processes or presenting conditions (such as chest pain) where the implementation of evidence-based pathways must appreciate the underlying system process of a given clinical environment. What FRAM really highlights is **who the experts are**: they are **not just the developers of guidance**, they are **also the members of staff doing the work and the patients being treated**. The experiences of both staff and patients will develop and facilitate the changes likely to be most beneficial to all parties.

# “Work-as-imagined” and “work-as-done”

Design (tools, roles, environment)



Work-As-Imagined

Work & production planning (“lean” - optimisation)



Work-As-Imagined

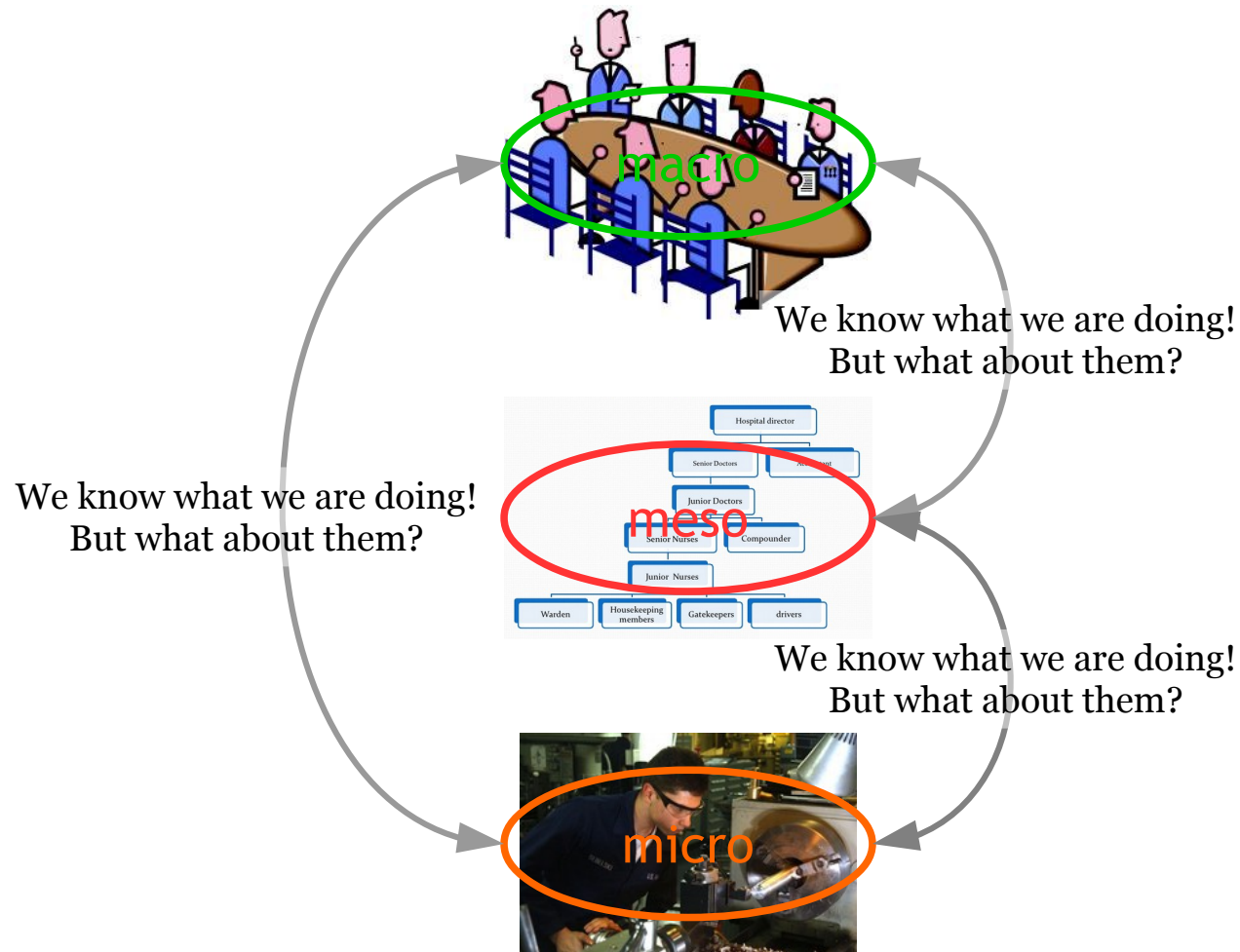
Safety management, investigations & auditing



Work-As-Imagined



# Mutual (mis)understanding



Clinical work takes place in a complex socio-technical system. In order to be effective, any kind of description or prescription of work must be based on a realistic understanding of Work-as-Done.

What does it look like at your place of work?