Victorian MET/Rapid Response Team Analysis and Reporting

Recommendations for a MET/ RRT Data Specification

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VICTORIA State Government | Health and Human Services

Why?

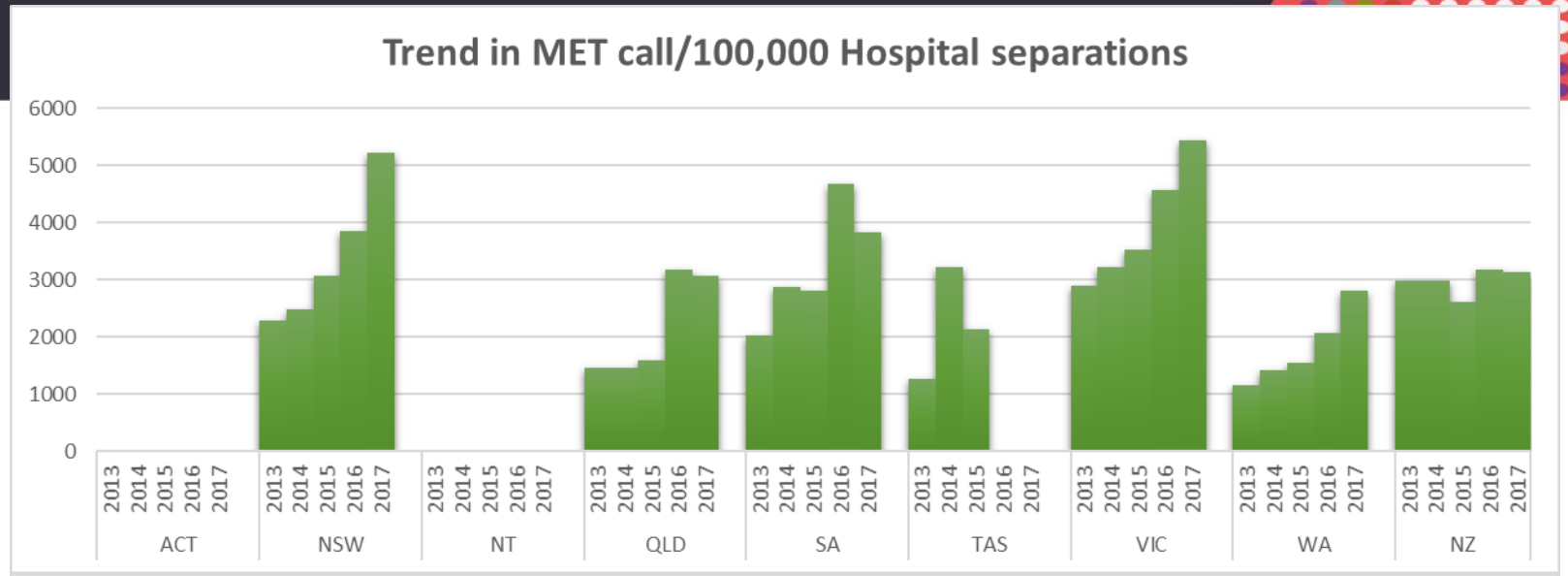
- **RRT activity has been inexorably rising**
- **Much stress and Anxiety in our profession**
- **Failure to engage and resource by many hospitals and Health Networks**
- **State and National Governance Authorities - minimal oversight of RRT outcomes**
- **National Accreditation Standard (Deteriorating Patient)**

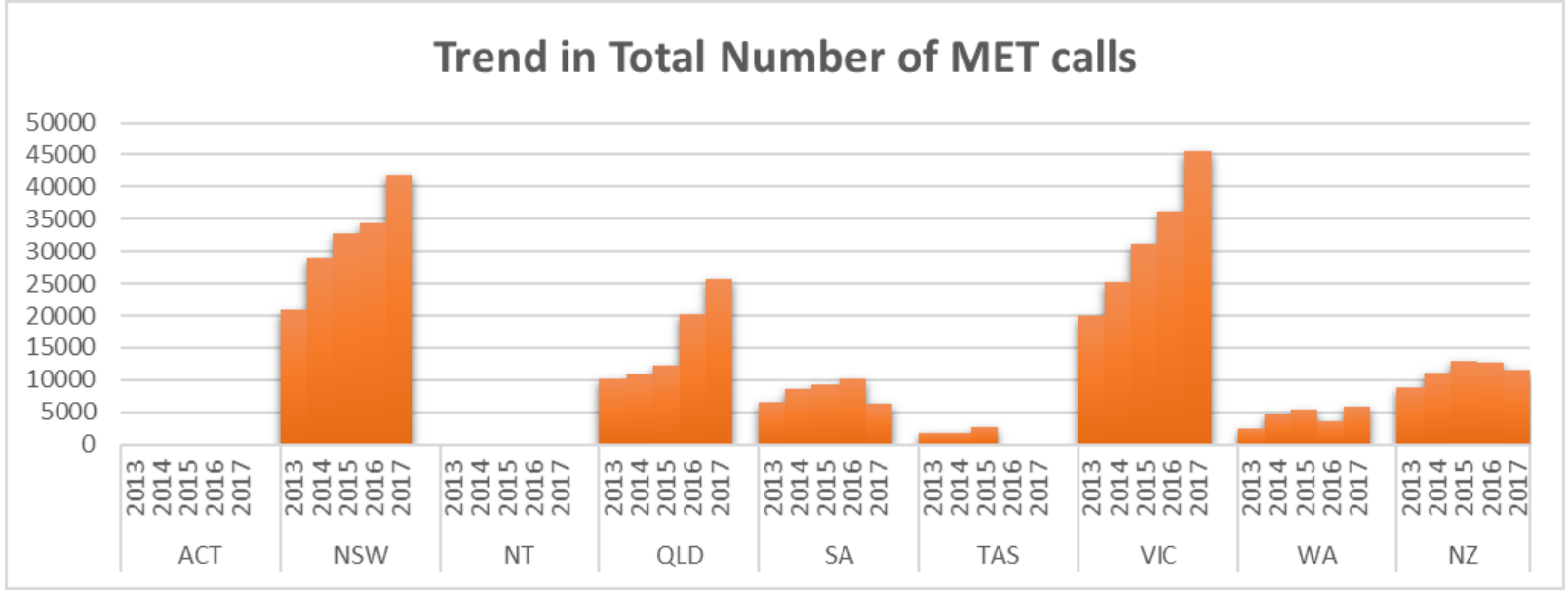
- **Victorian Collaborative RRT improvement project 2016-2019**
- **Differing governance structures, resource levels, case mix and role delineation**
- **Method (team structure, activation criteria etc) used, the dose of response, training, certification of staff competencies, audit and reporting of outcomes**

ANZICS CCR RRT/MET trends 2013-17

- Vic – NSW :150% increase in activity over 5 yrs
- We don't understand it
- There is no systematic monitoring of process or outcomes in Victoria
- Governance failure

- We need a sustainable reporting, analysis and research platform across jurisdictions.
- Linked to ICU admissions data
- Optimise modern technology systems





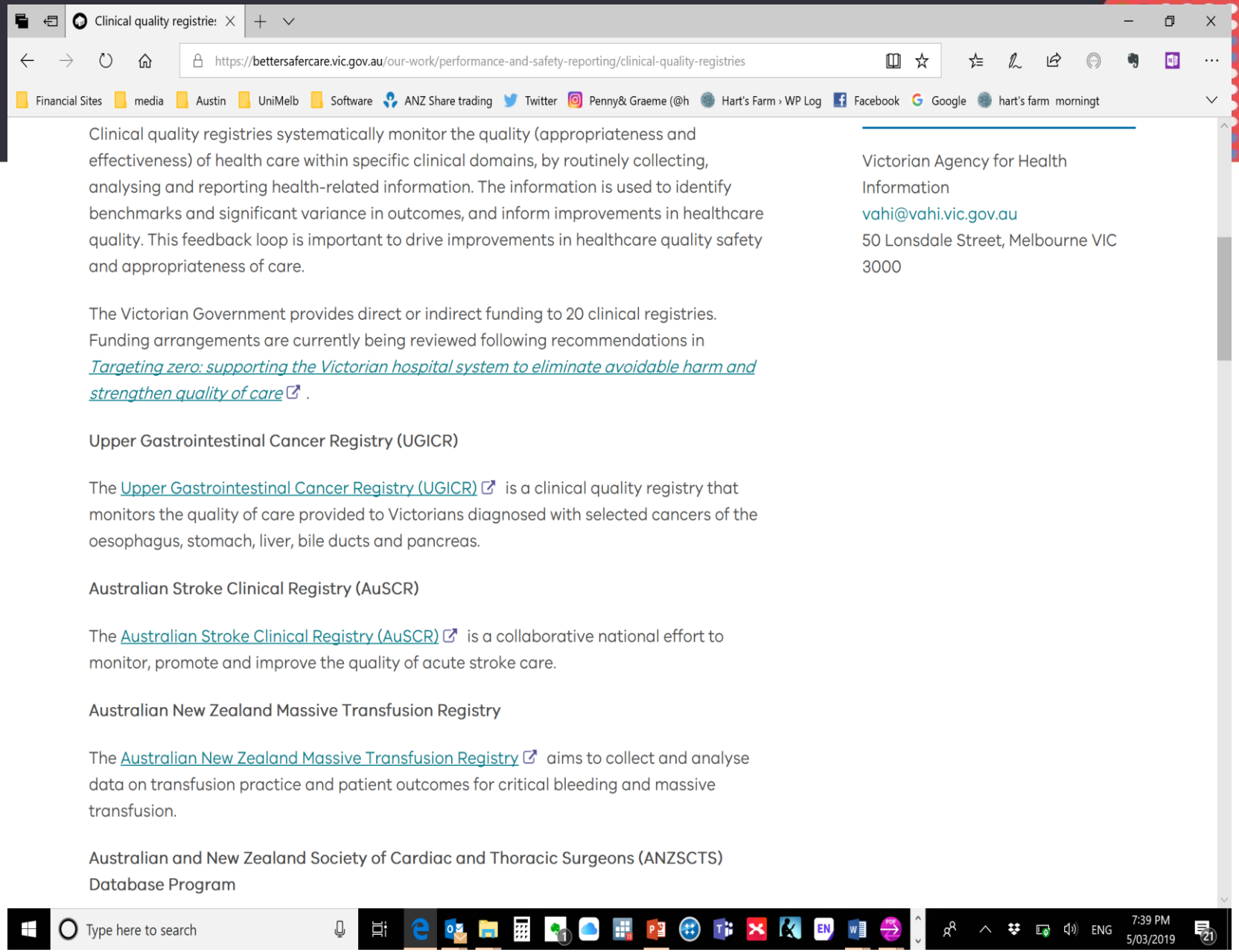
Minimum Dataset

Least possible data required to provide the Quality metrics for the Disease Register

Tightly defined and curated data

Very manual data collection

- **ANZICS CORE**
- **ASCTS**
- **Prostate Cancer Registry**



Maximum dataset

Content and Relationships describing Optimal Data Scheme

Measure what is necessary not what is manually achievable

- **The cupboards and shelves with labels**

Objectives:

1. **To establish Victorian RRT maximum data set, incorporating currently established Victorian hospital data collection tools, together with published literature and patient flow maps.**
2. **Identify where Data Linkage to Electronic Medical Records or Administrative Data Sets would allow additional missing elements “low overhead” data collection.**
3. **To define an ontology that frames these datasets in the context of state, national and international data standards.**
4. **To provide a formalised basis for national and international registry data definitions and comparisons.**

Participating Hospitals

Network	Hospital	Role Delineation	Adult	Paediatric	Obstetric incl Neonatal	VicTOR Hospital
Albury Wodonga Health	Albury Wodonga	Rural/Regional	1	1	1	
Austin Health	Austin	Tertiary	1			1
Ballarat Health	Ballarat	Rural/Regional	1	1	1	1
Bendigo Health	Bendigo	Rural/Regional	1	1	1	1
Barwon Health	Geelong	Tertiary	1	1	1	1
Cabrini Health	Cabrini	Tertiary Private	1	1	1	1
Eastern Health	Box Hill	Metro	1	1	1	
Eastern Health	Maroondah	Metro	1	1	1	
Eastern Health	Peter James	Metro	1	1	1	
Eastern Health	Angliss	Metro	1	1	1	
Eastern Health	Healesville	Metro	1	1	1	
Eastern Health	Wantirna Health	Metro	1	1	1	
Eastern Health	Yarra Ranges Health	Metro	1	1	1	
LaTrobe Regional Health	LaTrobe Regional Hospital	Rural/Regional	1	1	1	1
Monash Health	Monash Medical Centre	Tertiary	1	1	1	1
Northern Health	The Northern Hospital	Metro	1	1	1	1
Melbourne Health	Royal Melbourne Hospital	Tertiary	1		1	
Peninsula Health	Frankston Hospital	Metro	1	1	1	
The Womens	Royal Womens Hospital	Tertiary	1		1	
Western Health	Sunshine	Metro	1	1	1	
Western Health	Western	Metro	1			
Western Health	Western Paediatrics	Metro		1		
VCCC	Peter McCallum Cancer Hospital	Tertiary	1	1		
St Vincents Health	SVH	Tertiary	1			
Epworth	Epworth Richmond	Tertiary Private				1
NorthEast Network	Wangaratta	Rural/Regional				1
18 Networks	27 Hospitals		23	19	19	10

Methods: Adjunct Project to SCV MET enhancement collaboration

- **Metadata (data collection instrument : screen dumps, data dictionary, spreadsheet column headers & field options)**
- **Publicly available tools - NSW Clinical Excellence Commission website “ Between the Flags” Data collection tool.**
- **International MET/RRT publications : American Heart Association Cardiac Arrest / Rapid Response Team, Canadian single hospital published dataset**
- **Draft Variables for the ANZICS CORE RRT national dataset**
- **Patient flow mind map data models**
- **Variable mapping : Clinical Context, Semantic Classification, Variable Name and Value Domains.**
- **Preliminary patient interviews re PREMS**
- **A validation workshop of Victorian Adult, Paediatric, Medical, Nursing: December 2018.**
- **Consultation with NZ, ACSQHC, ACT, NSW Health / CEC**

Some Victorian Data Sets – display variation

Albury Wodonga	Austin	Ballarat	Sunshine
Date	ID	Display ID	Met call ID
Time	Call Type	Call Date	
MRN	UR No	Gender	
Surname	Surname	Date of team arrival	Call Date
Ward	First Name	Date of Stand down	Call Time
Reason For Call	Sex	Time of team arrival	Site
Outcome/ Destination	Birth Date	Time of Stand down	Location / Ward / Dept
NFR pre call	Location	Primary Reason for Call	Unit
NFR post call	Unit	Category of primary reason	MET / Code Blue Team Responding
Not for MET pre call	Call Date	Clinical Response	Primary Reason for MET
Cardio-resp Arrest	Call Time	Location	Interventions
<72hrs out of ICU	Call Time Known	Admission Diagnosis	MET Diagnosis
MET within 24 hrs admit	Called by	Current Treating Clinician	Initial MET Outcome
Excluded from KPI's admit <24 hrs or ed/ paed	Arrival Date	Last Medical Review	Admission Diagnosis
>1 MET this month	Arrival Time	Goals of Care Plan Prior	Outcome(s) at 24 Hrs
AMO	Arrival Time Known	Type - Goals of Care Plan Completed Prior	Criteria Present (0 - 6 Hrs Prior)
Discharge status	Admission Diagnosis	Goals of Care Plan Completed Post	Criteria Present (6 - 24 Hrs Prior)
Mortality	MET Call Reason	Type - Goals of Care Plan Completed Post	Longterm Outcome
Time at MET (minutes)	Medications	24 Hrs prior to call, Patient in:	
Notes	Cardiac Life Support	Initial Outcome	
	Fluid Therapy	Outcome(s) at 24 Hrs	
	Respiratory	Outcome at discharge	
	Neurology	Date of Hospital Discharge	
	GIT / Metabolic	Were any of the following issues encountered at the response?	
	Renal	Documentation missing	
	Procedures		
	Procedures Other		

Data Alignment

Standardised Variable	Albury Wodonga	Austin	Ballarat
ANZICS Site Id		Site id	Site id
Local DB ID		ID	Display ID
Call Type		Call Type	Clinical Response (MET / Resp B)
UR No	MRN	UR No	
Surname	Surname	Surname	
First Name		First Name	
Sex		Sex	Gender
Birth Date		Birth Date	
Location	Ward	Location	Location
Unit	AMO	Unit	Current Treating Clinician
Location 24 hrs prior			
HospAdmission Date/Time		Adm Date / Adm time	
Hospital Admission Source			
Last ICU Discharge Date/Time			
Call Date	Date	Call Date	Call Date
Call Time	Time	Call Time	
Cal lDate Time			
Call Time Known		Call Time Known	
Called by		Called by	
Last Medical Review			
Arrival Date		Arrival Date	Date of team arrival
Arrival Time		Arrival Time	Time of team arrival
Arrival Time Known		Arrival Time Known	
Date of Standown			Date of Stand down
Time of Standown			Time of Stand down
Admission Diagnosis		Admission Diagnosis	Admission Diagnosis
MET Call Reason	Reason For Call	MET Call Reason	Primary Reason for Call
Category of Primary Reason			Category of primary reason
Medications		Medications	
Cardiac Life Support		Cardiac Life Support	
Fluid Therapy		Fluid Therapy	
Respiratory		Respiratory	
Neurology		Neurology	
GIT / Metabolic		GIT / Metabolic	
Renal		Renal	
Procedures		Procedures	
Procedures Other		Procedures Other	
Radiology		Radiology	
Cardiac		Cardiac	
Infection		Infection	
Metabolic		Metabolic	

Rapid Response Team (Red Zone) - EMRU, Mr Allan

*Performed on: 02/06/2014 1019 AEST

- Rapid Response
- Assessment, Inter
- RRT All Respond

Rapid Response (Red Zone)

Last Reviewed: July 2012

INTRODUCTION

Date / Time Patient in Red Zone **/**/****

Date / Time Call Received **/**/****

Date / Time Patient First Seen **/**/****

Is the Patient on Std. Maternity Obs. Chart? ○ Yes ◉ No

Senior Responder / Team Leader: Tran, Amy

Additional Responders? ○ Yes ○ No

Teams activated

- ☐ Cardiac Arrest Team
- ☐ CERS Assist
- ☐ Outreach
- ☐ Rapid Response Team
- ☐ Attending Medical Team
- ☐ Other:

SITUATION

Primary Reason for Rapid Response Activation

Other reasons for Rapid Response Activation - Red Zone Criteria (Tick all that apply)

- ☐ Respiratory Arrest
- ☐ Airway obstruction or stridor
- ☐ Respiratory Rate high
- ☐ Respiratory Rate low
- ☐ SpO2 low
- ☐ Increasing O2 requirements to maintain SpO2
- ☐ ABG/VBG
- ☐ Systolic Blood Pressure high
- ☐ Systolic Blood Pressure low
- ☐ Heart Rate high
- ☐ Heart Rate low
- ☐ AVPU Score = P or U
- ☐ Sudden decrease in GCS >= 2 points
- ☐ Seizures
- ☐ Urine output low
- ☐ Blood Glucose Level low
- ☐ Blood Glucose Level high
- ☐ Lactate > 4mmol/L
- ☐ Deterioration not reversed within 1 hour of Clinical Review
- ☐ Serious concerns by staff
- ☐ Serious concerns by family / patient
- ☐ Other:

BACKGROUND

Previous Clinical Review / Rapid Response (Last 24 hrs)

- ☐ Yellow Zone trigger without Clinical Review call
- ☐ Yellow Zone trigger with Clinical Review
- ☐ Red Zone trigger without Rapid Response call
- ☐ Red Zone trigger with Rapid Response
- ☐ Not Applicable

Current Medical Orders

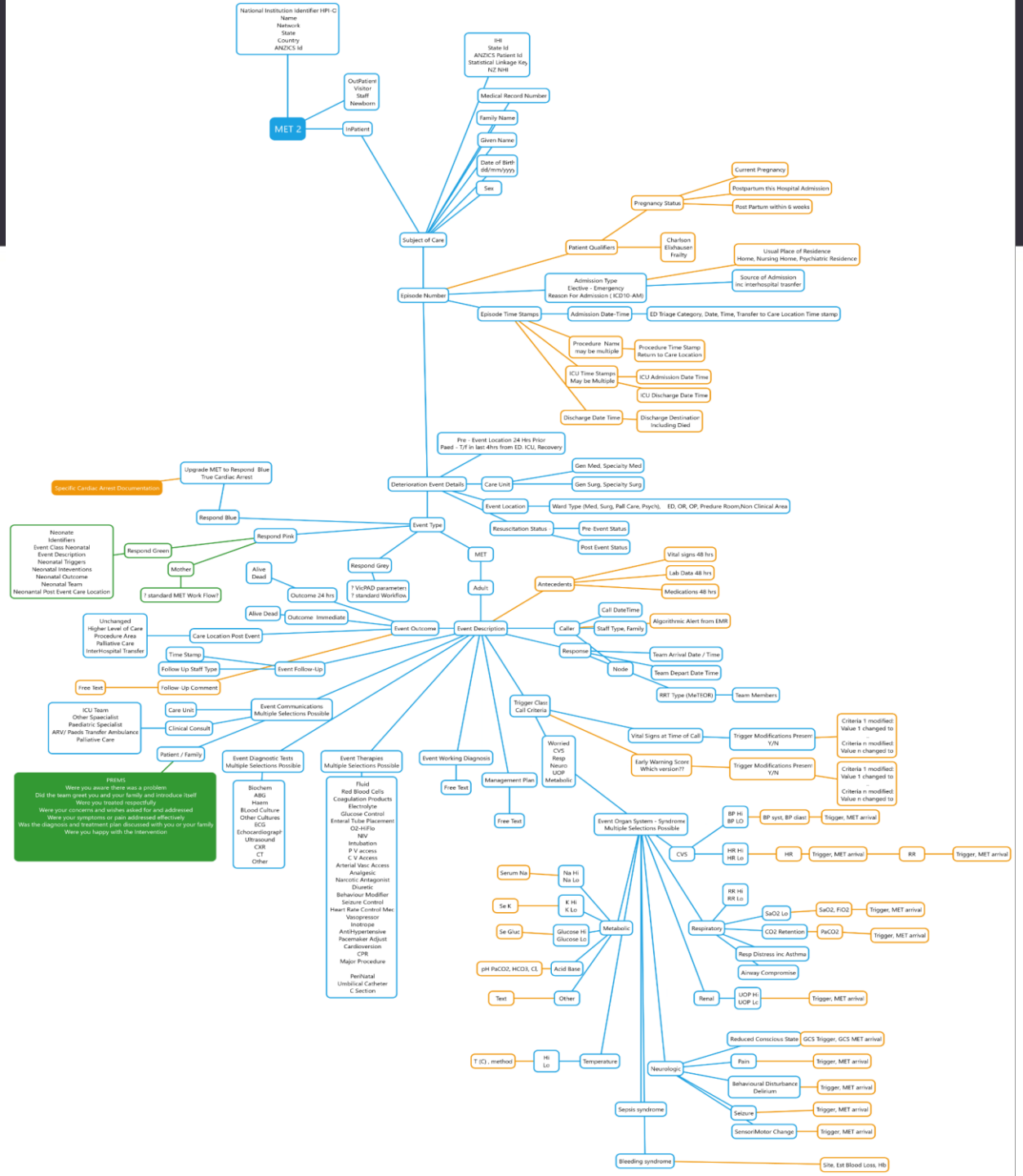
- ☐ Altered Calling Criteria
- ☐ Not for Rapid Response
- ☐ Not for CPR
- ☐ Natural Death / Palliative Care Pathway
- ☐ Not Applicable
- ☐ Other:

Background / History

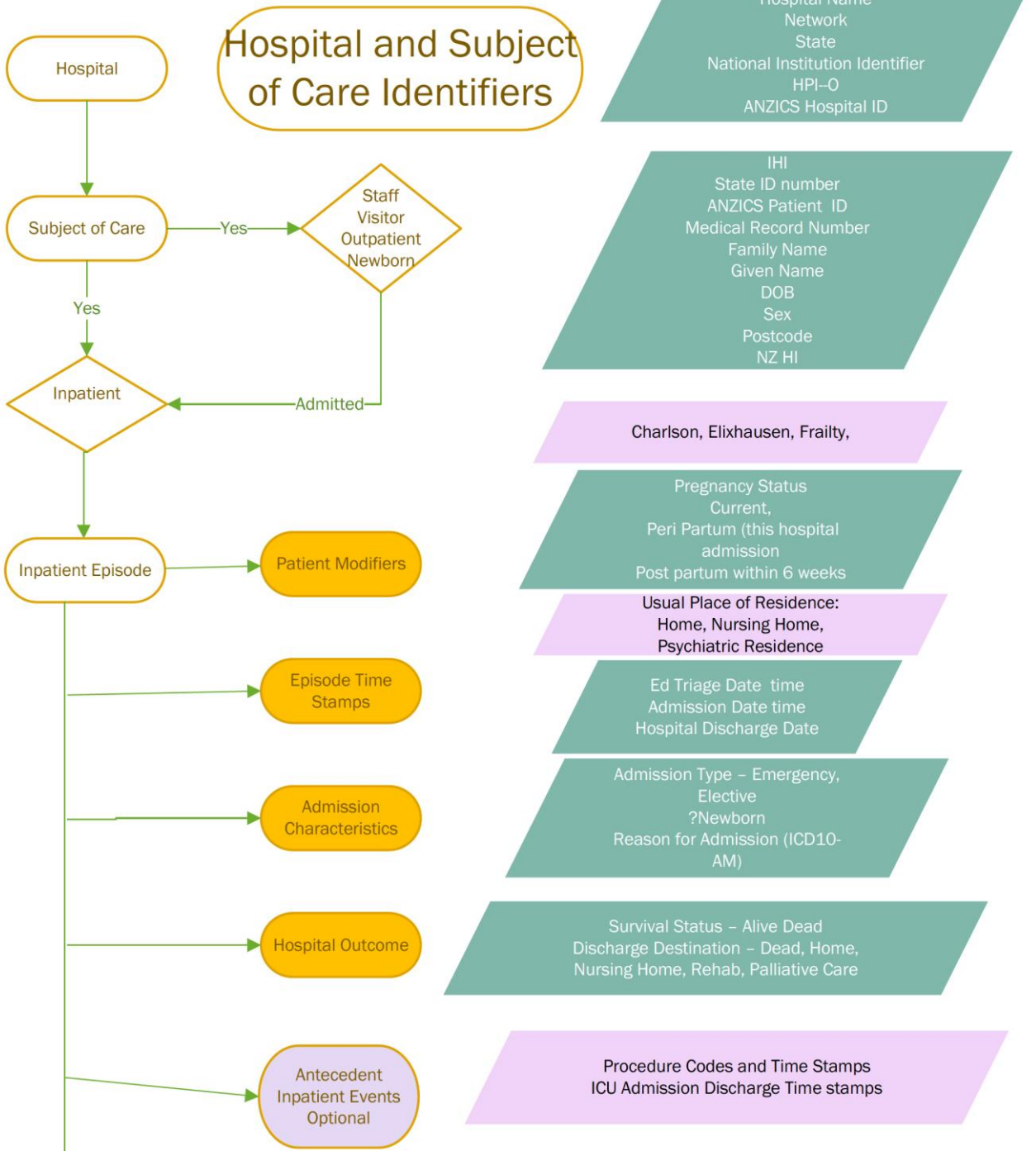
Results

- **27 hospitals from 18 Victorian Health Networks contributed metadata.**
- **Datasets varied from 20-75 data points.**
- **Wide variation in naming conventions (eg. Date of Birth, Age, Age Group)**
- **Neonatal (Code Green) and Obstetric datasets varied considerably from adults in event descriptor variables though concepts are similar.**
- **No hospital collected Patient Reported Measures.**
- **Maximum dataset was developed that incorporates 7 clinical contexts and 32 semantic concepts.**

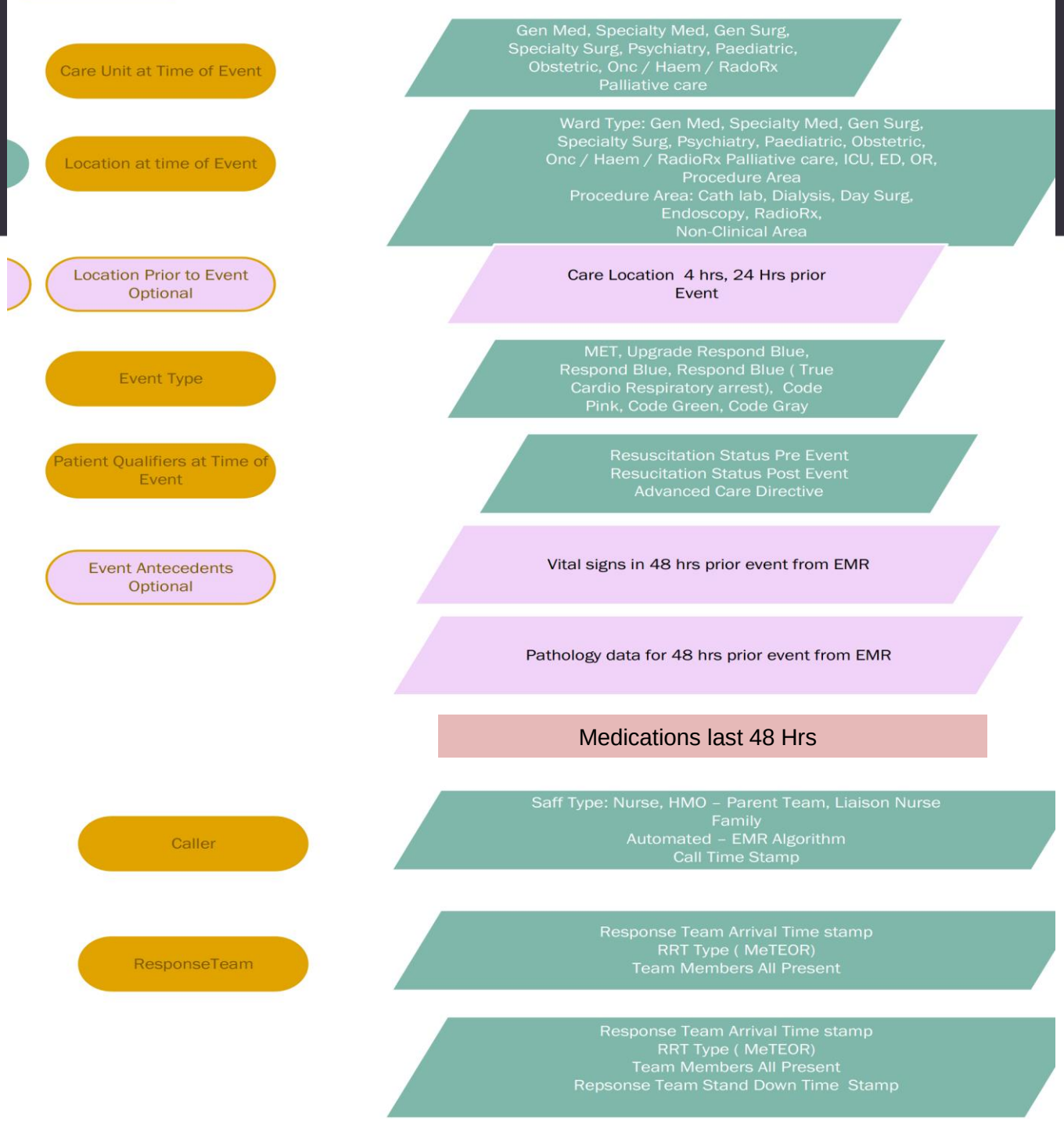
Patient Centred Mind Map



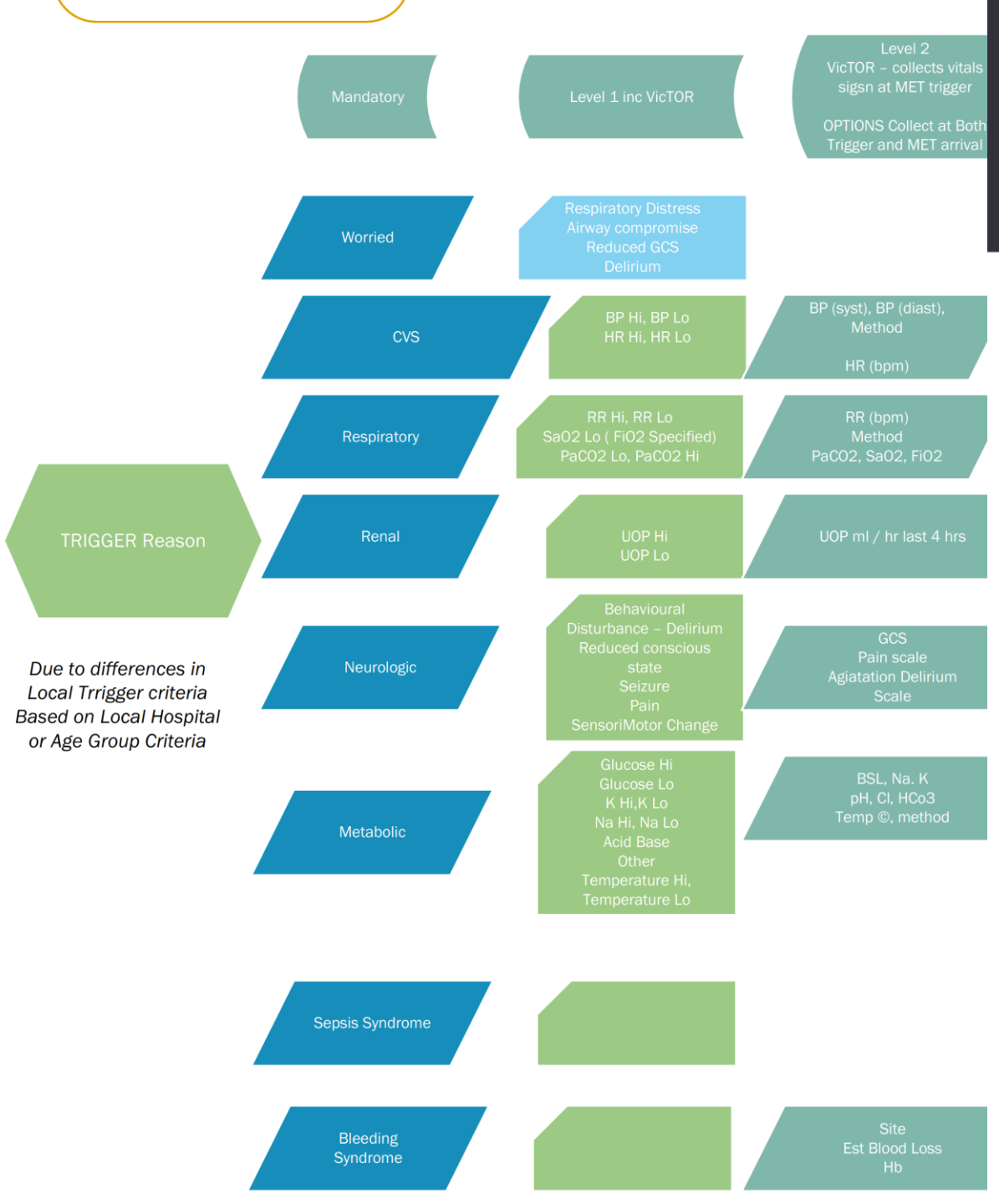
Hospital & Subject of Care identifiers



Event Details



Triggers


Mandatory
Level 1 inc VicTOR
Level 2
VicTOR – collects vitals sigsn at MET trigger
OPTIONS Collect at Both Trigger and MET arrival
Worried
Respiratory Distress
Airway compromise
Reduced GCS
Delirium
CVS
BP Hi, BP Lo
HR Hi, HR Lo
BP (syst), BP (diast), Method
HR (bpm)
Respiratory
RR Hi, RR Lo
SaO2 Lo (FiO2 Specified)
PaCO2 Lo, PaCO2 Hi
RR (bpm)
Method
PaCO2, SaO2, FiO2
TRIGGER Reason
Renal
UOP Hi
UOP Lo
UOP ml / hr last 4 hrs
Due to differences in Local Trrigger criteria Based on Local Hospital or Age Group Criteria
Neurologic
Behavioural Disturbance – Delirium
Reduced conscious state
Seizure
Pain
SensoriMotor Change
GCS
Pain scale
Agiatation Delirium Scale
Metabolic
Glucose Hi
Glucose Lo
K Hi,K Lo
Na Hi, Na Lo
Acid Base
Other
Temperature Hi, Temperature Lo
BSL, Na. K
pH, Cl, HCo3
Temp ©, method
Sepsis Syndrome
Bleeding Syndrome
Site
Est Blood Loss
Hb

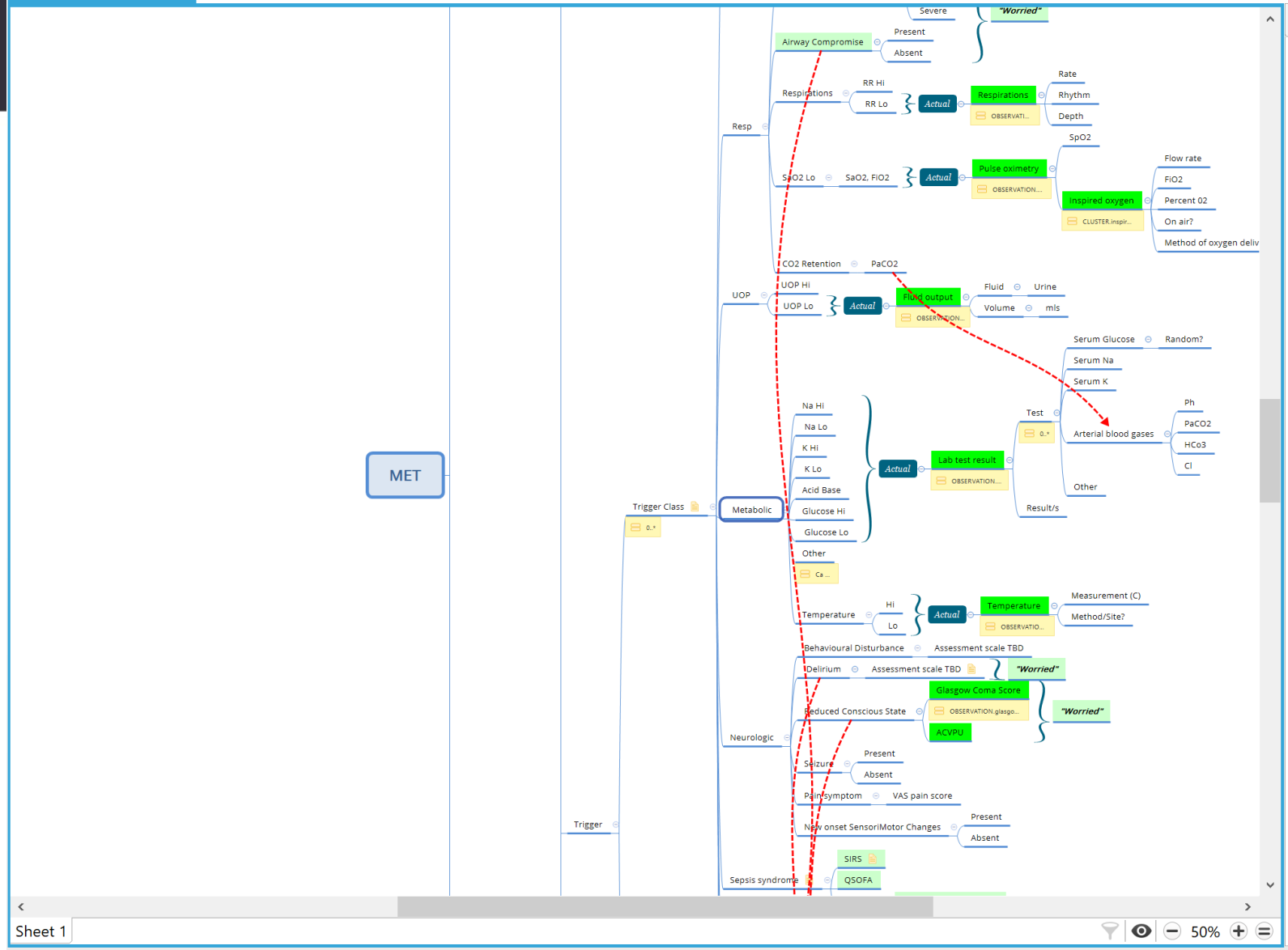
PREMS

- DRAFT1
-
- Were you Aware you had a Problem (Y/N)
- Did the Team Greet You and Your Family and Introduce themselves (Y/N)
- Were you treated Res[ectfully (Y/N)
- Were your concerns and wishes asked for and Addressed (Y/N)
- Were your symptoms of distress or pain addressed effectively (Y/N)
- Was the Dignosis and Treatment Plan Explained and discussed with You and / or Your Family (Y/N)
- Were you Happy with the Intervention (Y/N)

2019 25 Jan MET RRT.xmind

File Edit View Insert Modify Tools Window Help

2019 25 Jan MET RRT



Outline

None

- Inspired oxygen
  - Flow rate
  - FiO2
  - Percent 02
  - On air?
  - Method of oxygen delivery
- Temperature
  - Temperature
- Glasgow coma Score, AVPU
- Lab data
- Timing
  - In last 48 hours
    - Laboratory test result
      - Test name
        - Se Sodium, Potassium, Chloride, Bic
        - Arterial Blood Gas : pH, PaCO2, PaO
        - Haemoglobin, Platelet, WCC, Neutr
      - Result
  - Primarily for research
- Procedure
  - Procedure name
  - Procedure Time Stamp?
- ICU admission
  - ICU Admission Date Time
  - ICU interventions
  - ICU Discharge Date Time
- Medications
  - Class, Dose
  - Primarily for research
- Event Details
  - Event Type
    - MET
    - Respond Blue
    - Respond Pink
    - Respond Green
    - Respond Grey
    - Upgrade MET to Respond Blue
    - Cardiac arrest documentation

Sheet 1

50%

Topic (Metabolic)

Auto Save: ON DESKTOP-5DODLH7

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ENG 7:25 PM 5/03/2019

Data Extract

PAS
Hospital Data

Critical Care Resources Annual Survey
Team Number / Constituency
Training
Trigger Criteria: HR, RR, SystBP, SaO2, UOP
Acute Hospital Admissions (N)

RRT HOSPITAL DATA EXTRACT PROCESS

EMR
Vital Signs
Pathology
Medications

Proposed KPIs

CORE MET Reporting	Measure
MET dose	Met calls / hospital bed days
MET dose	Cardiac arrests / 1000 hospital admissions
MET dose	MET calls / 1000 hospital admissions
Indicator	MET Calls with 48 hrs of ICU discharge
Indicator	MET Calls with ICU admission
Indicator	New limitation
MET comparisons	Missed or late Calls
MET comparisons	Immediate mortality
MET comparisons	Hospital mortality
MET comparisons	New limitation
MET comparisons	Multiple MET calls
MET comparisons	Specialty
MET comparisons	Hosp Event Type
Early Warning Score	registry calculates an EWS using the submitted physiology and an agreed scoring method
Early Warning Score	% distribution of EWS.
Early Warning Score	Hospital mortality for each EWS band
Early Warning Score	Paediatric version of same
Early Warning Score	Obstetric version of same.

EMR, VHIMS, Other
Event specific PoC Data

Aggregation after Patient Coding

Registry
ANZICS CORE

Archival Data Conversion

PILOT
ARCHIVAL DATA CONVERSION
? 10 YEARS RRT DATA

Hospital 1
30 fields

Hospital 2
60 fields
ICD10 AM

Hospital 3
45 fields
ICD10 AM
Vital Signs

Hospital 4
30 fields

Hospital N
X fields

Shared Conversion Code

Endorsed Maximum Dataset Framework
10 yrs x 500 /yr X 10 sites
50000 events !

Next Steps

Consultation with

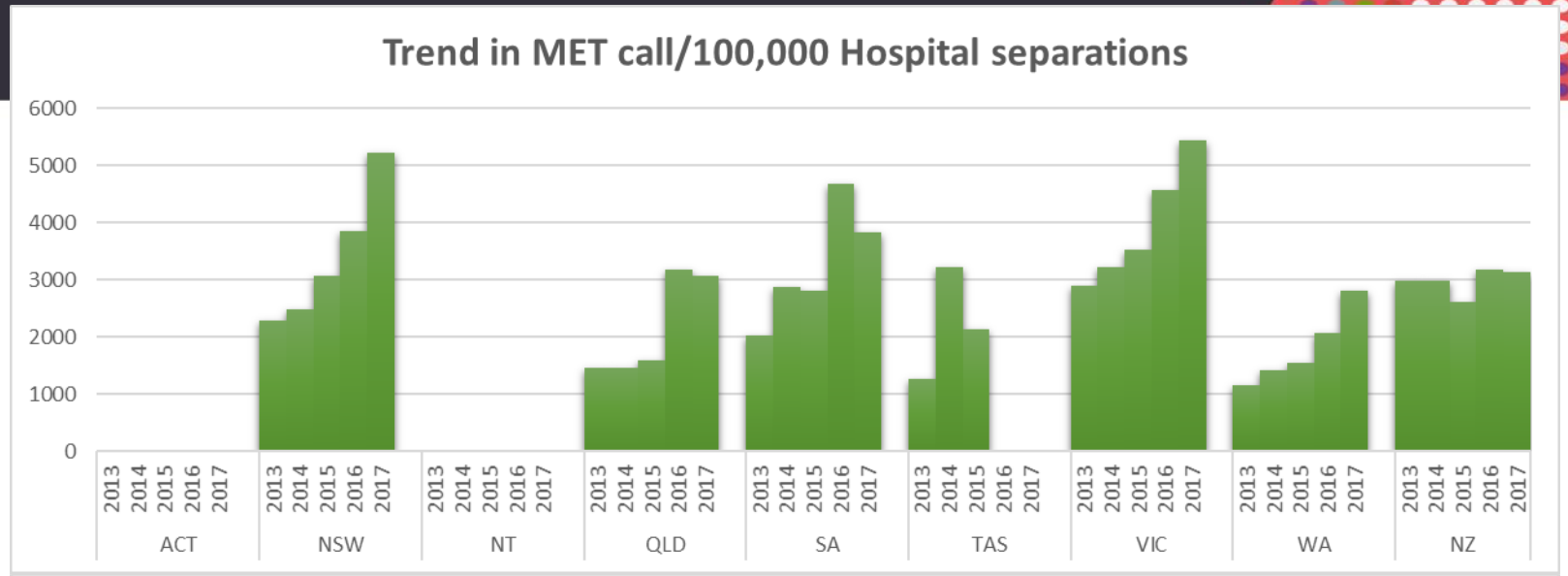
- **NSW Health and CEC**
- **ACT**
- **NZ practitioners**
- **ACSQHC**
- **Publish**
- **Work with ANZICS to generate conversion script**

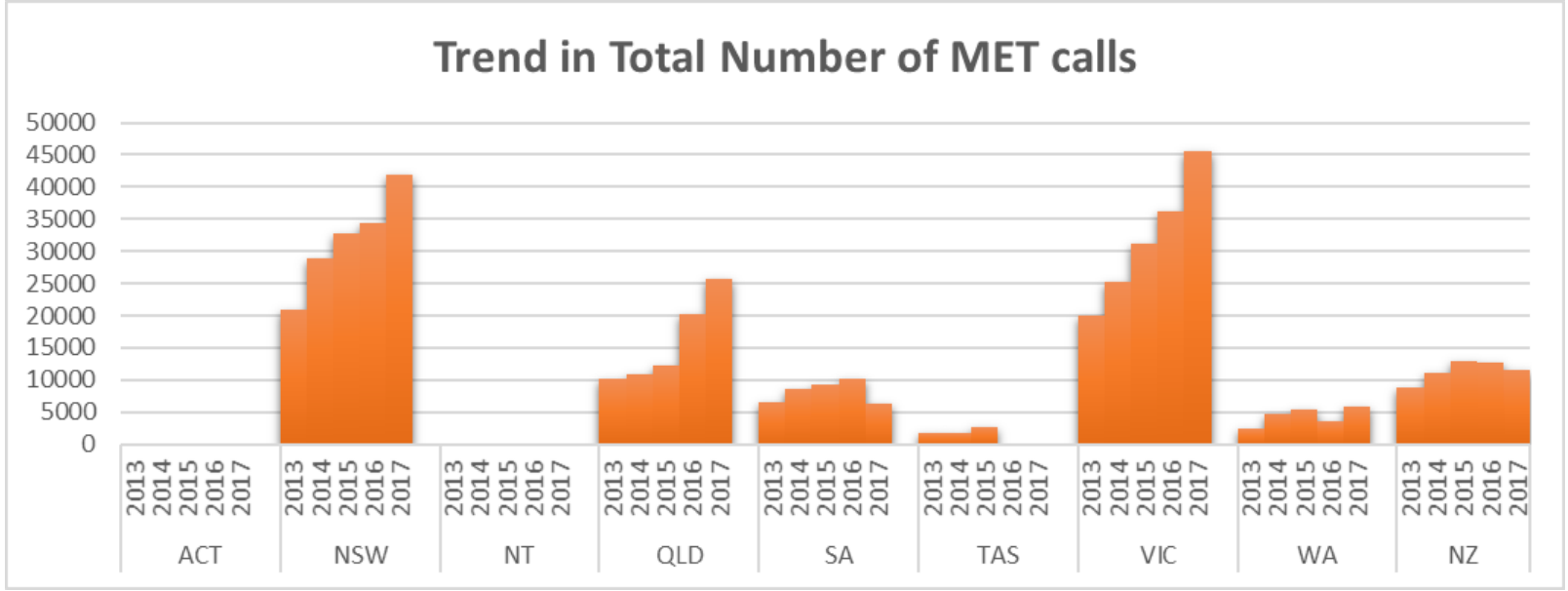
ANZICS CCR RRT/MET trends 2013-17

- Vic – NSW :150% increase in activity over 5 yrs
- We don't understand it
- There is no systematic monitoring of process or outcomes in Victoria
- Governance failure

- We need a sustainable reporting, analysis and research platform across jurisdictions.
- Linked to ICU admissions data
- Optimise modern technology

- WE MUST CONTROL THE MESSAGE

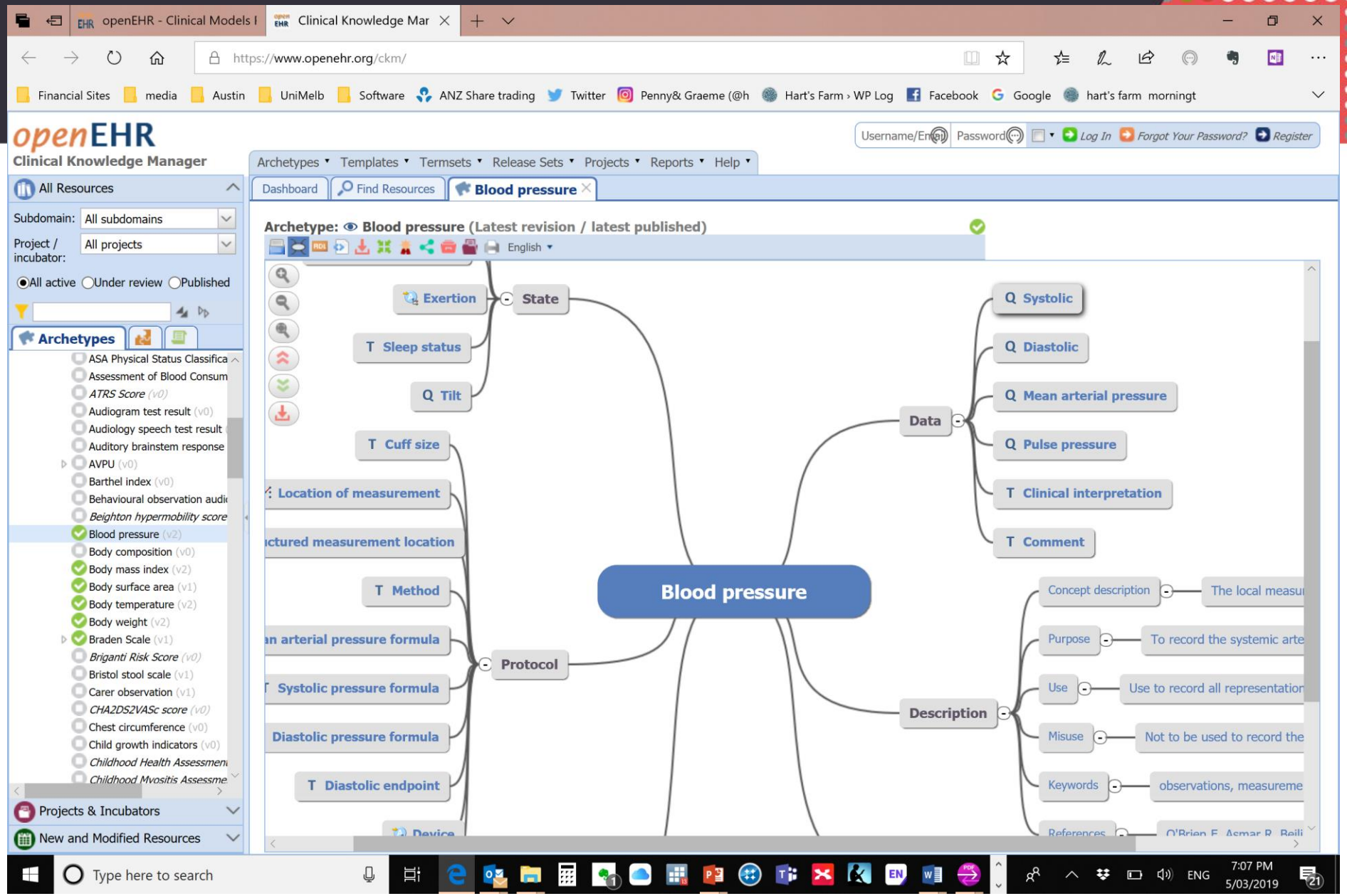




OpenEHR

Archetypes formalise description of:

- **Observations**
- **Actions**
- **Processes**
- **Findings**



Event Details

Event Outcomes

Outcome Immediate : Alive Dead
Outcome 24 hrs : Alive Dead

Care Location Post Event:
Unchanged, Higher Level of Care, Procedure Area, Palliative Care, InterHospital Transfer

Event Communications

Care Unit, Clinical consult – In Hospital, Clinical Consult – External Specialist
ARV

Paediatric consult – Internal
RCH/MMC
PIPER

Family
Patient

Event Detail

Vital signs at Team Arrival

Trigger Modifications Present

Actions


Investigations
Biochemistry
ABG
Haem
Coags
Blood Culture
Other Culture
ECG
Echocardiograph
CXR
Cavity Ultrasound
CT
MRI
Other
Therapies
Fluid
RBC Tx
Coagulation Products
Glucose control
Eneteral Tube Placement
O2 HiFlo
NIV
Intubation
PV Access
CV Access
Arterial Access
Analgesic
Narcotic Antagonist
Diuretic
Behaviour modifican
Drug
Restraint
Seizure control
Heart Rate control
Vasopresor
Inotrope
Anti_hypertensive
Pacemaker Adjust
Cardioversion
CPR
Major Procdure
PeriNatal
C Section
Umbilical Catheter
Working Diagnosis
Free Text
Management Plan
Free Textr

Stakeholders of Data Review

SCV MET Quality Improvement Hospitals

Additional Participant Network Hospitals

VicTOR Paediatric RRT Hospitals

Other volounteer Hospitals

ANZICS CORE

NSW Between the Flags

(NZ review and comment)

(Maternity and PeriNatal Clinical Network)

Total Sites: 18 Networks, 27 hospitals, NSW CEC, ANZICS CORE Draft, AHA, Peer Review Literature