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# Medication Safety a numbers game

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Change Champions – improving medication safety

Wednesday, 10<sup>th</sup> March, 2010



# Numbers and medication safety

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- Cost
- Continual monitoring and assessment
  - Incident reporting
  - Indicator use
  - Patient level
- Errors with numbers



# Medicines use

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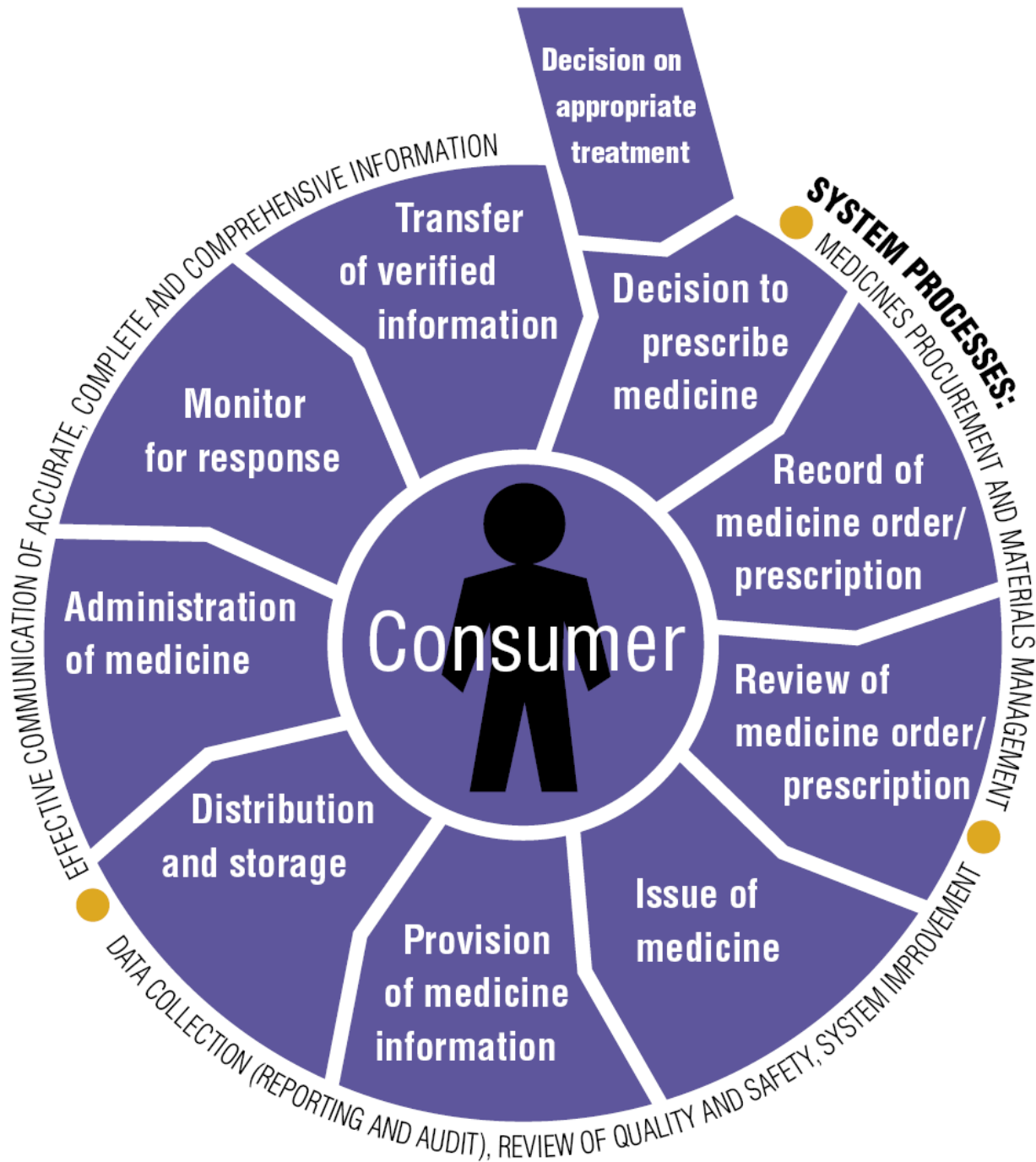
- Australia spends \$10 Billion plus per annum on medicines
- 7 in 10 Australians will take at least one medication in any two week period
  - 9 out of 10 for older Australians
- Average of 7.2 medicines taken per day by hospitalised patients
- Estimated \$660 Million per annum treating medication related hospitalisations

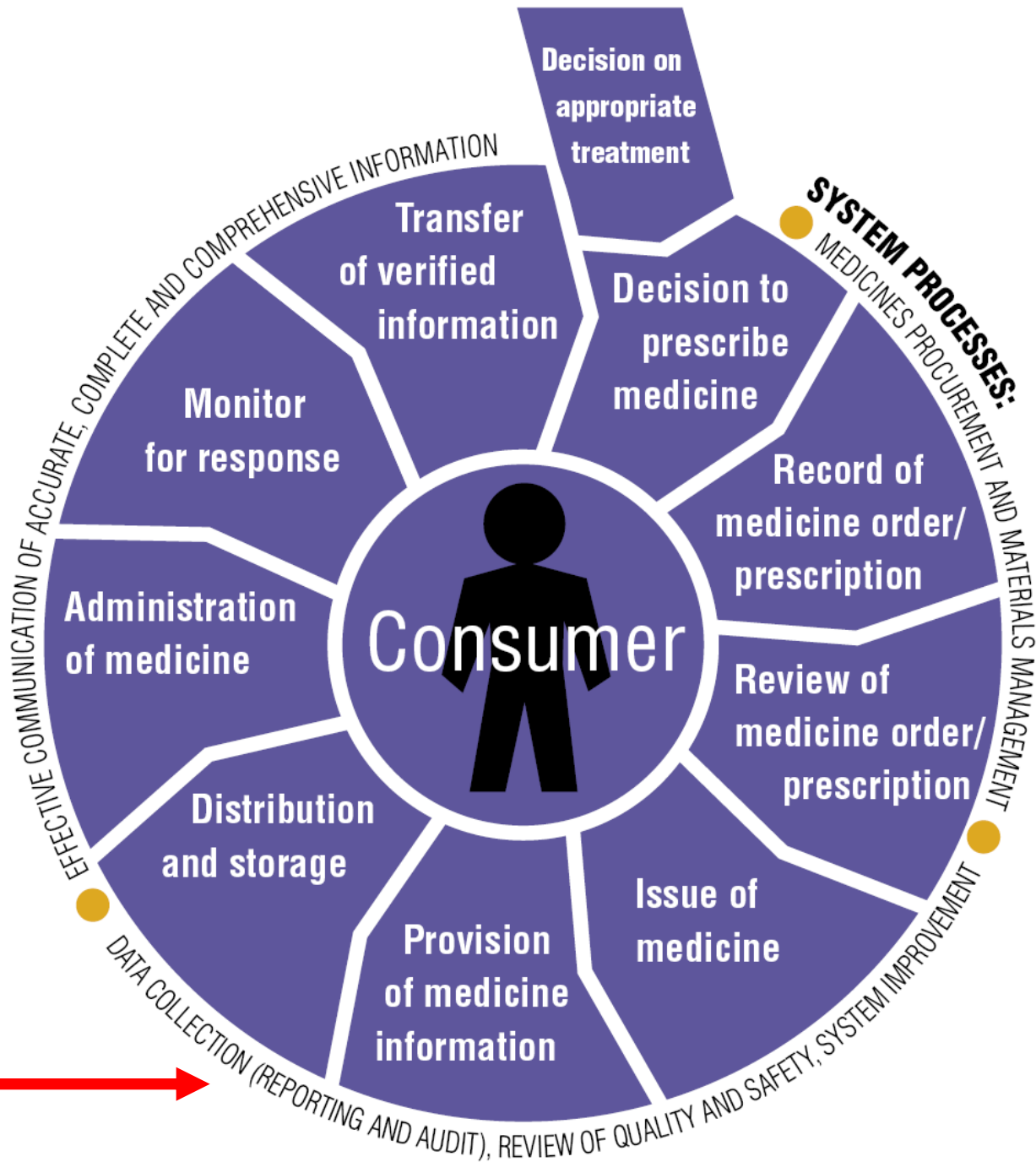


# Measurement and monitoring

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- Crucial element of medication management
- Vital at system and individual patient levels
- Need to be able to meaningfully interpret data in order to monitor and improve safety and quality
- Turning data into information





# Data collection, review of quality and safety

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- Major sources of information
  - Incident data
  - Indicators



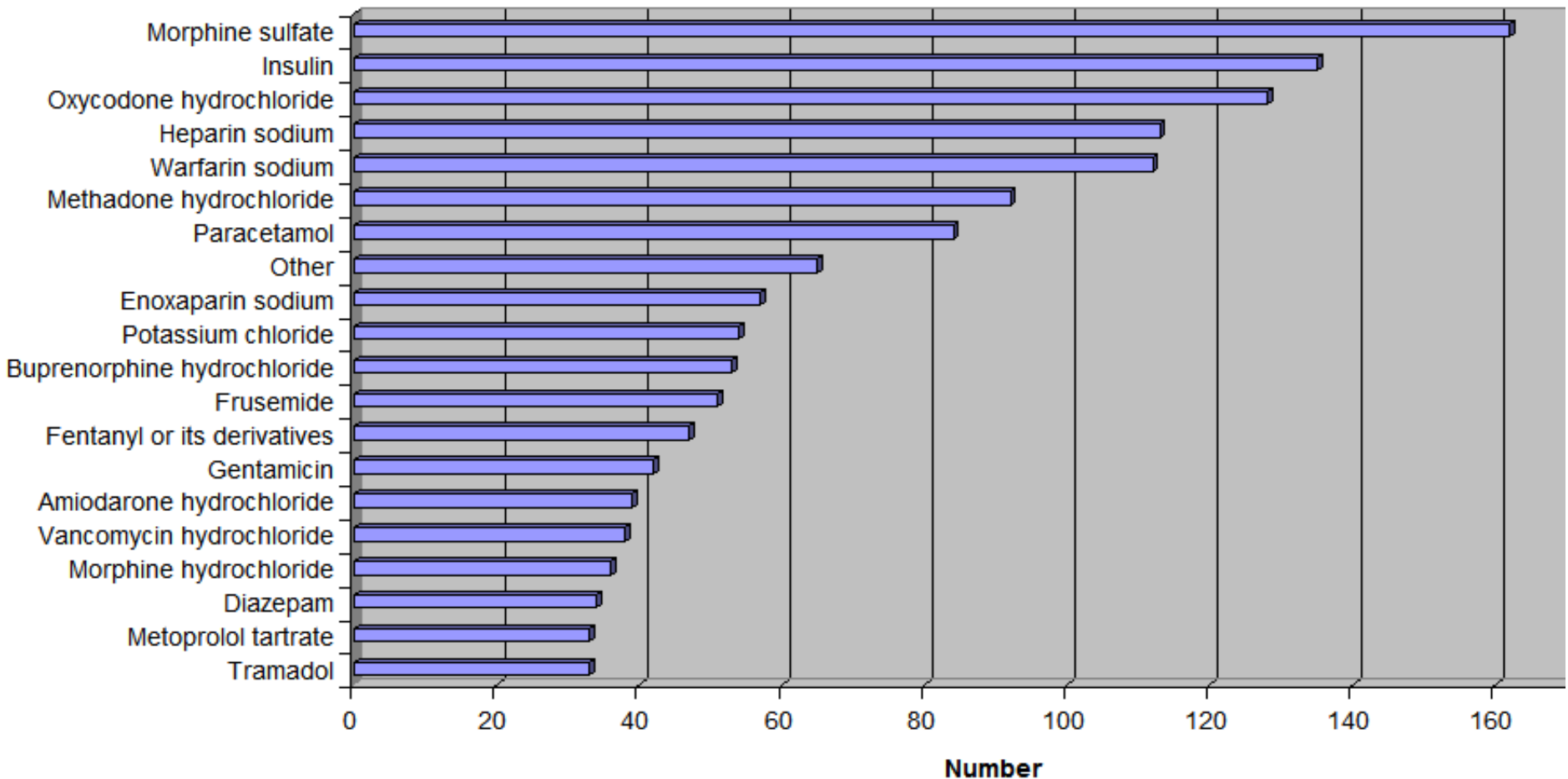
# Medication incidents

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- Approximately 20,000 reported medication incidents per year in NSW
- Similar rates nationally
- What have we learned?
  - Medicines frequently reported
  - Medicines frequently associated with harm



# Incidents by medication





# Medicines

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- Anticoagulants
- Opioid analgesics
- Insulin
- Antibiotics



# Error types

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- We know what medications are involved
- We can estimate harm is caused
- Taxonomy has limitations
  - Reconciliation issues?
    - 27% of patients have discrepancy between history and orders  
(Gleason, 2004)
    - Can we identify these incidents in our data?
    - Are we asking the right questions?



# Taxonomy

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- Are we identifying common factors?
  - Requirement for monitoring
  - Inadequate education and training
  - Poor packaging and label design
- Need to refine our taxonomy



# Variation and comparability

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- Voluntary reporting systems
  - Impossible to compare volume from voluntary reporting systems
- Taxonomy differences
  - Can not compare proportion of types
- Need for a standard, national taxonomy
  - National Coordination Centre for Medication Error Reporting and Prevention (NCC MERP)



# Indicators

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*... "measures of structure, process and outcomes of health care that can be used to guide and monitor the quality and appropriateness of healthcare delivery with the aim of health care improvement"<sup>1</sup>*



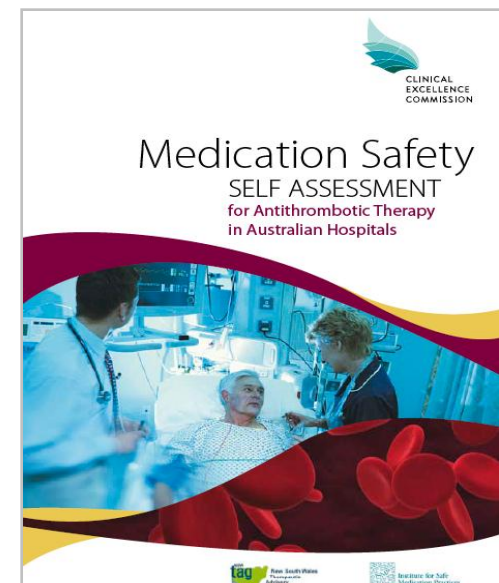
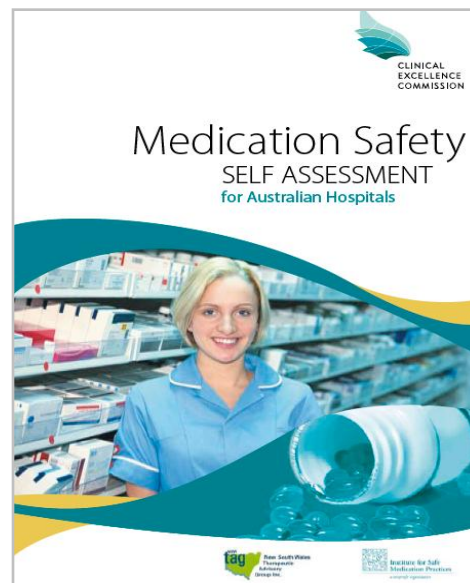
<sup>1</sup> Schaff R, Schumock G, Nadzam D. Development of the Joint Commission's indicators for monitoring the medication use system. Hospital Pharmacy 1991; 26:326-329, 350..



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# Structure indicators

- Medication Safety Self Assessments are a collection of structure indicators



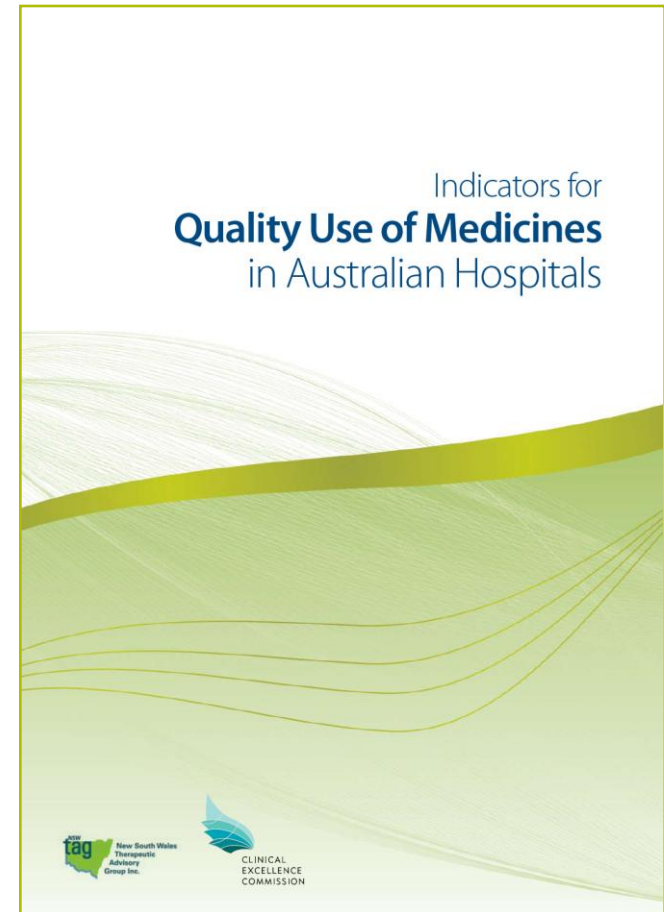


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# Process indicators

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- Evidence based, field tested and validated indicators for measuring Quality Use of Medicines





# Indicators

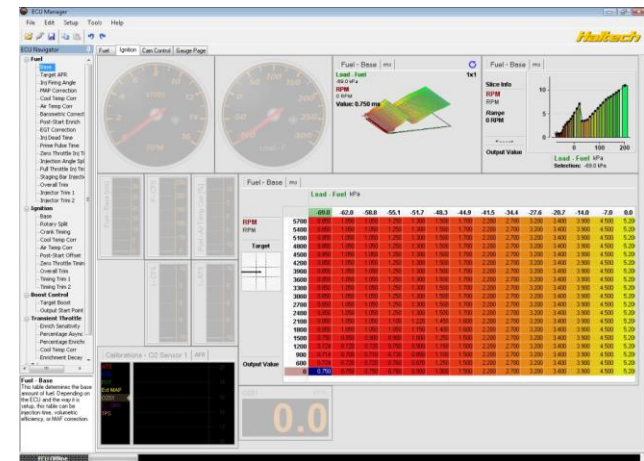
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- How do we make collection of indicator data routine?
- How do we make data meaningful for clinicians?
- How does this work in other settings?



# Formula One

- Real time performance monitoring
  - For driver
  - For pit crew
- Post race performance review
- Used to ensure best performance on day and improve future performance
- Feedback



Real-time pit data



# Dashboards

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- Provide critical information on progress and allow identification of risks





# Missing numbers

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- Outcome indicators
- Regular use of triggers
  - Abrupt cessation of medicines
    - Useful for reconciliation, adverse reactions
  - Use of antidotes
    - vitamin K, naloxone, flumazenil



# Numbers at patient level

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- Therapeutic drug monitoring
  - Aminoglycosides
  - Anticoagulants
- Pathology results
- Clinical numbers
  - Blood sugar levels, respiration rate
- Polypharmacy



# Calculation errors

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- Major source of error, especially in administration of medicines
  - After omission, wrong dose is most common incident type
- Calculation of infusion rates
  - Various units
    - mL/min, mg/min, microgram/kg/min



# Solutions

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- Standardise concentrations – especially for high risk medicines
- Provide protocols and decision support tools
- Use ready-made products

# Communicating numbers – verbal

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- “Give a whole one”
  - A whole ampoule of midazolam (10mg) administered instead of a whole 1 mg
- “Give 5mLs”
  - 50mg (10mg/mL) morphine administered instead of 5mg (1mg/mL)

# Communicating numbers – written



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Date	Medication (Print Generic Name)	Route	Dose	Frequency & NOW enter times	Indication	Pharmacy
19/4/08	Penicillin	IV	1.8gr	q 4hrs		

*Note: The handwritten dose '1.8gr' is circled in red. A red box labeled 'Tick if Slow Release' is present above the medication name. A yellow highlight covers the bottom portion of the form.*



# Challenges

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- Make numbers work for us
- Reduce numbers like \$660,000,000