

Costing Adverse Events by Linking Incident Monitoring and Clinical Costing Systems

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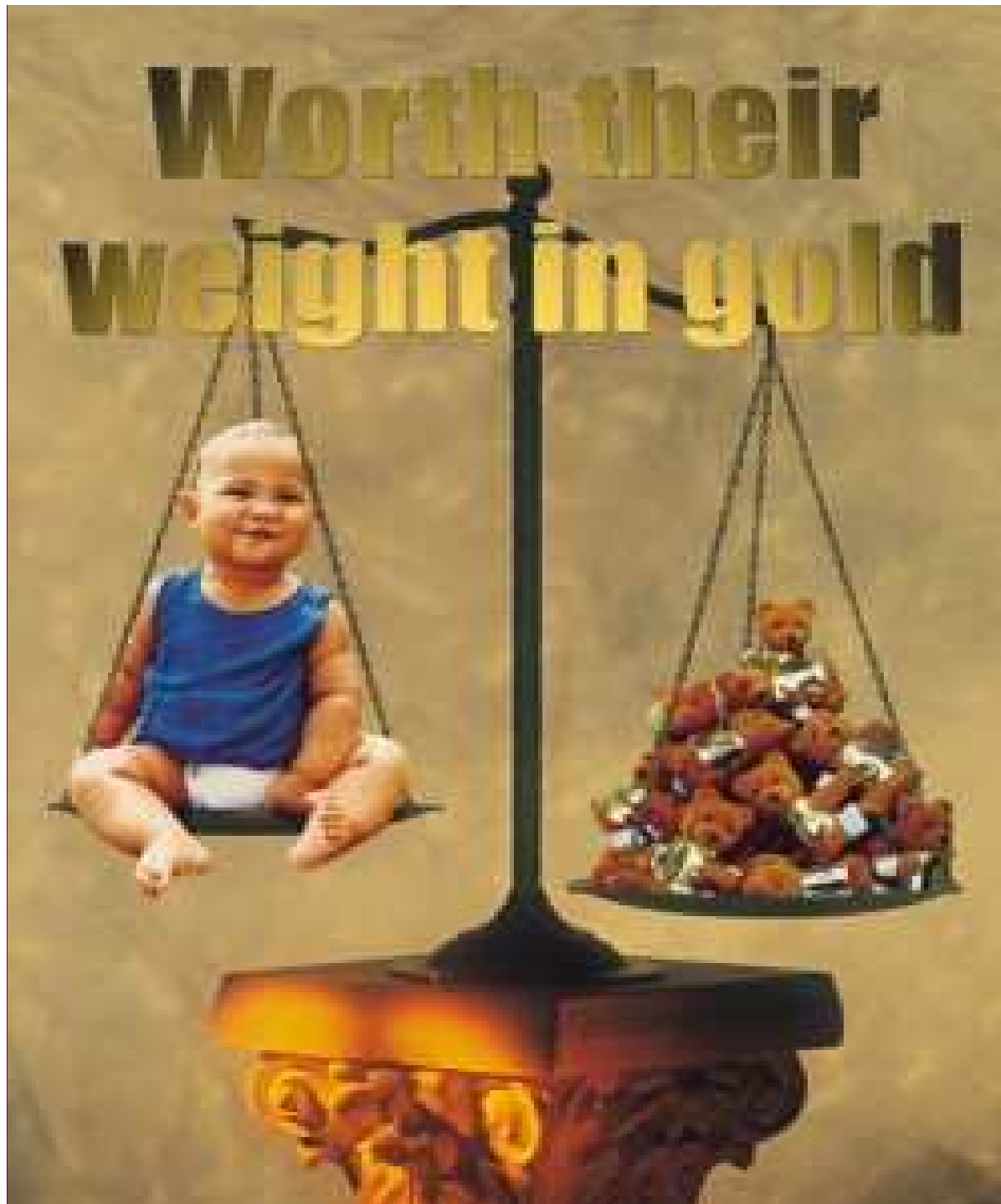
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Delia Dent, Business Development Manager

Patient Safety International

11 October, APSF Summit 2006



Safety and
Budget,
Equal
Partners in
Health Care

Data

QAHCS, 1995

- AE's accounted for 7.1 additional bed days
- 16.6% admissions associated with an adverse event (revised to 10.6% in 2000)

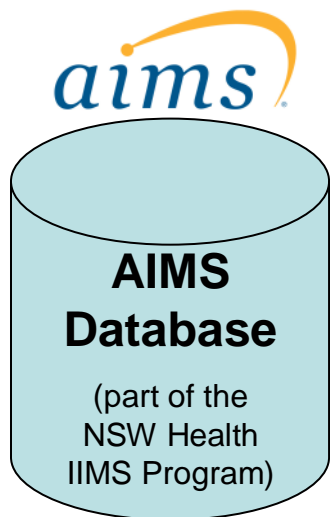
• 50% of AEs considered preventable
Australian hospital admissions of 4.3m

- 456,000 AEs
- 73,000 resulting in major disability
- 13,000 resulting in death
- 3.2m additional bed days

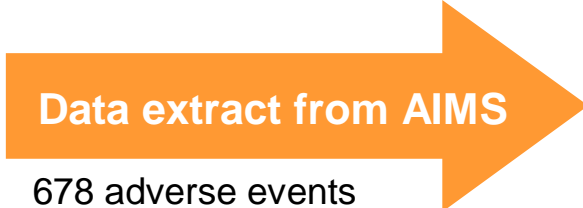
Literature

- QAHCS
 - Wilson et al (1995)
- Setting Priorities for Patient Safety
 - Runciman, Edmond and Pradhan, Quality and Safety in HealthCare 2002;11:2224-229
- IOM: Crossing the Quality Chasm Series
 - To Err is Human (1999)
 - Crossing the Quality Chasm (2001)
 - Patient Safety Data Standards (2004)
 - Preventing Medication Errors (2007)
- Institute for Healthcare Improvement
 - Maureen Bosignano and James Mountford
 - Jack Silverstein

The Process



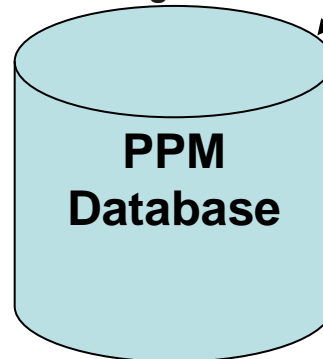
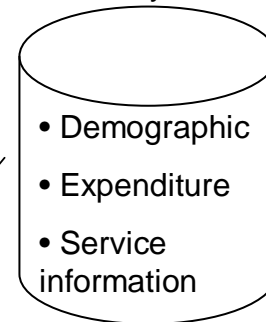
incident reporting, management and analysis



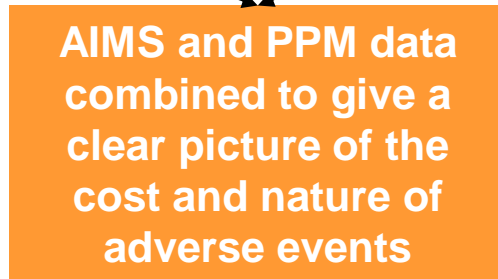
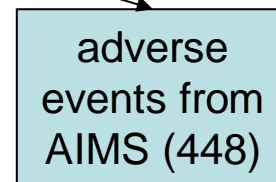
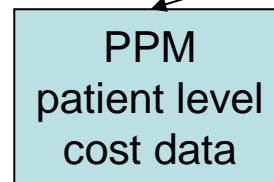
678 adverse events (Jul-Dec 2004)
Including information to aid in matching AEs to costed episodes of care



Inpatient data imported from other systems



hospital reporting, revenue management, patient costing, activity-based budgeting and patient billing



- PowerPerformance Management
 - Cost Manager
 - ETVL
 - Extraction
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 - Data Load
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 - Patient Details**
 - Revenue Manager
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 - Revenue Calculation
 - Product Lines Assignment
 - Coding Auditor
 - Coding Auditor
 - PowerBusiness Reporting
 - Executive Reporting
 - OLAP Reporting

Patient Details CoA 0405, GL0405

Patient Demographics |
 Episode Details |
 ICD Coding |
 Episodes Non Admitted |
 Patient Services |
 Patient Funding

Selected Episodes

Episode Num.	Record
URN	Name

Field Name	Episode Value
Episode Number	438972
Hospital	A207
Hospital Stay Number	
Episode Link Number	
Area Health Service	CHW
Patient Type	1 [Over Night Stay]
Admission Type	! [Default Value]
Date Of Birth	13/10/94
Address	
Suburb	
Postcode	2085
Referral Source	7 [Health Practitioner other tha...
Admission Date	28/10/04
Admission Time	02:01 PM
Separation Date	06/11/04

DRG Code	Version
F07Z [Othe...	4.2
F07B	5

HDF's	
HDF value 1	0
HDF value 2	2
HDF value 3	3
HDF value 4	1
HDF value 5	42
HDF value 6	429
HDF value 7	8.26
HDF value 8	8.25
HDF value 9	5.2
HDF value 10	5.19

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Patient Details CoA 0405, GL0405

Patient Demographics | Episode Details | ICD Coding | Episodes Non Admitted | Patient Services | Patient Funding

Selected Episodes

Episode Num.	Record
URN	Name

Date Of S...	Area	...	Service Code	Service Code Desc
31/10/04	077 PATIENT SAFETY	1	AIMS-Medications/IV fluids	AIMS-Medications/IV fluids
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013240	Gamma-Glutamyltransferase...
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013265	Potassium
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013395	Sodium
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013545	Total Protein
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013540	Bilirubin Total
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013030	Alanine Transaminase(Alt)
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013140	Bicarbonate
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013135	Chloride
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013020	Albumin
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013025	Alkaline Phosphatase
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013085	Calcium
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013080	Creatinine
31/10/04	009 BIOCHEMISTRY LAB	1	PA-CHEM-1013560	Urea

Navigation buttons: << < Search > >>

PowerPerformance Management
PowerKnowledge Builder

Results 2004

- 678 AE's were reported
- 448 linked to an inpatient episode of the 13,682 separations during the study period
- 151 (34%) Medication/IV fluids
- 105 (23 %) Clinical Management
- 7-13 % MDC Neo-plastic, mental health, neonatal.
- AEs in 44% DRG's - potential \$11.7M cost increase
- 89% of AEs resulted in an average cost increase of 20%

Top 10 DRG's 2004

	% Increase in Cost
X62B - Poisoning/Toxic Effects of Drugs & Other Substances Age<60 W/O CC (4.2)	508%
E70B - Whooping Cough and Acute Bronchiolitis W/O Catastrophic or Severe CC (4.2)	218%
D11Z - Tonsillectomy or Adenoidectomy (4.2)	194%
E62B - Respiratory Infections/Inflammations W Severe or Moderate CC (4.2)	191%
P06B - Neonate- Adm Wt >2499 g W Significant O.R. Proc W/O Multi Major Problems (4.2)	171%
E62C - Respiratory Infections/Inflammations W/O CC (4.2)	148%
R60C - Acute Leukaemia W/O Catastrophic or Severe CC (4.2)	145%
B76B - Seizure Age>2 W/O Catastrophic or Severe CC (4.2)	138%
E69C - Bronchitis and Asthma Age<50 W/O CC (4.2)	104%
F07Z - Other Cardiothoracic/Vascular Procedures W Pump (4.2)	86%

2004			
IncidentType	Total	% of total	rank
Accidents/Occupational Health	21	4.69%	6
Aggression	5	1.12%	10
Behaviour/human performance	29	6.47%	4
Blood/Blood Products	4	0.89%	13
Buildings/Fittings/Fixture	1	0.22%	16
Clinical Management	105	23.44%	2
Complaints	5	1.12%	10
Documentation	45	10.04%	3
Falls	26	5.80%	5
Medical Devices/Equipment	18	4.02%	7
Medications/IV fluids	151	33.71%	1
Nutrition	9	2.01%	9
Organisation Management	18	4.02%	7
Oxygen/Gases/Vapours	4	0.89%	13
Pressure Ulcer	5	1.12%	10
Security	2	0.45%	15
Grand Total	448	100.00%	

Results 2005

- 561 AE's were reported
- 351 (63%) linked to an inpatient episode of the 13,836 separations during the study period
- 121 (34.4%) Medication/IV fluids
- 100 (28%) Clinical Management
- 8-25 % MDC Neo-plastic, mental health, neonatal, hepatobiliary system & Pancreas.
- AE 38% DRG's accounting for a potential \$9.5M increase in hospital costs.

Top 10 DRG's 2005

	% Increase in Cost
E70B - Whooping Cough and Acute Bronchiolitis W/O Catastrophic or Severe CC (4.2)	217%
P06B – Neonate Adm Wt >2499 g W Significant O.R. Proc W/O Multi Major Problems (4.2)	213%
R60C - Acute Leukaemia W/O Catastrophic or Severe CC (4.2)	209%
B76B - Seizure Age>2 W/O Catastrophic or Severe CC (4.2)	193%
E62C - Respiratory Infections/Inflammations W/O CC (4.2)	170%
F75C-Other Circulatory System Diagnoses W/O catastrophic or Severe CC	167%
A06Z- Tracheostomy any age, any condition	137%
Q60A- Reticuloendothelial and Immunity Disorders W Catastrophic or Severe CC	134%
A41Z –Intubation Age <16	120%
F07Z - Other Cardiothoracic/Vascular Procedures W Pump (4.2)	72%

2005			
IncidentType	Total	% of total	rank
Accidents/Occupational Health	10	2.85%	7
Aggression	8	2.28%	8
Behaviour/human performance	23	6.55%	4
Blood/Blood Products	6	1.71%	10
Clinical Management	100	28.49%	2
Complaints	2	0.57%	12
Documentation	24	6.84%	3
Falls	21	5.98%	5
Medical	19	5.41%	6
Medications/IV fluids	121	34.47%	1
Nutrition	8	2.28%	8
Organisation Management	5	1.42%	11
Oxygen/Gases/Vapours	1	0.28%	14
Pathology/Laboratory	2	0.57%	12
Pressure Ulcer	1	0.28%	14
Grand Total	351	100.00%	

Findings

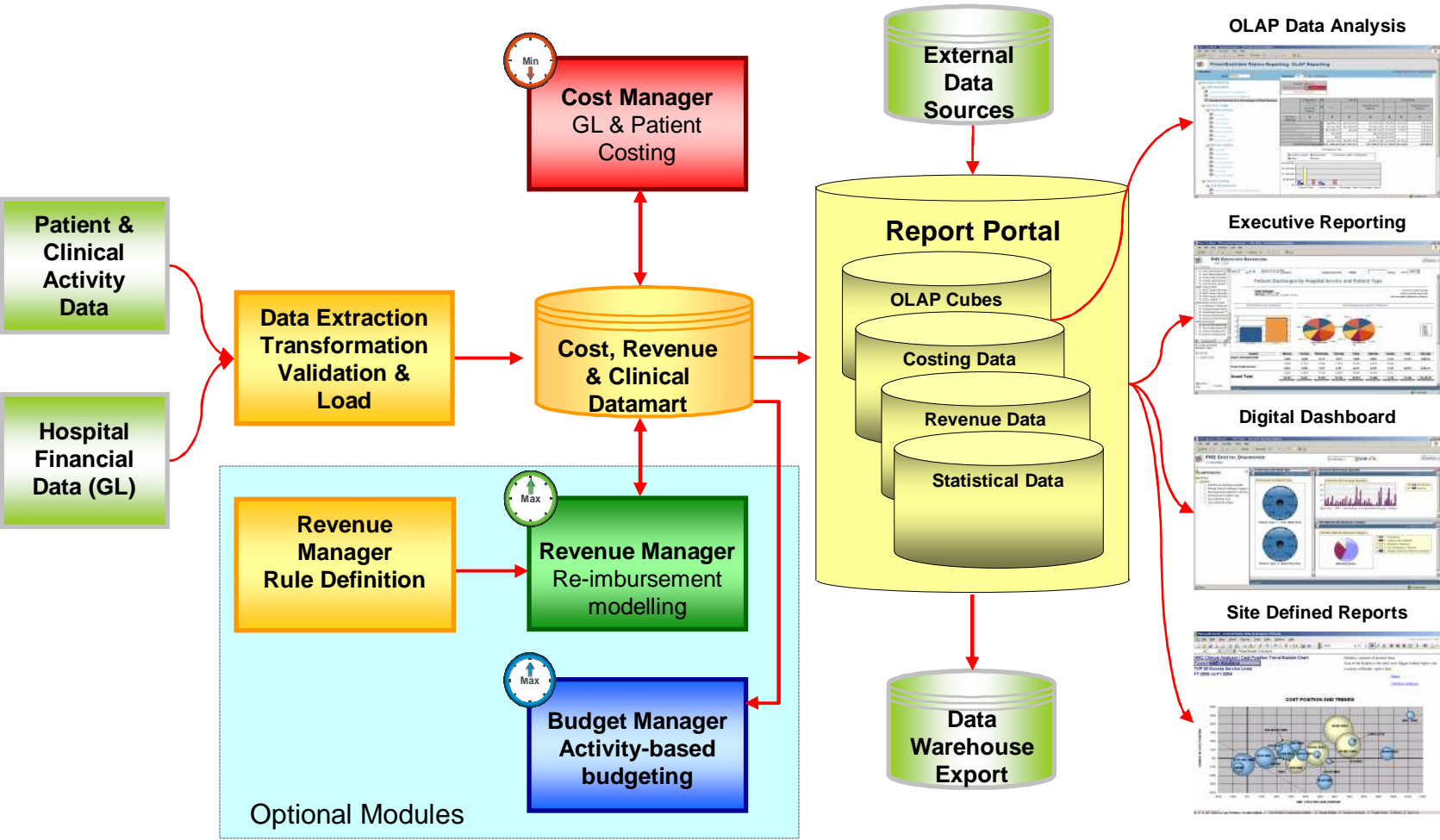
- \$6 –\$17 Million in potential Savings
- 37-51% AE's preventable
- Replicable and practical methodology
- Evidence on which to base specific improvements

Where to from here?

- Strategically link to guide improvement and system redesign
 - RCA
 - Move to redesign the patient journey
- Quantify additional cost of AE over natural complexity
- Extend the study to include seasonal factors
- Trim Points within DRG's
- Develop KPI's



PowerPerformance Management



Component	Description	Potential estimated impact	Comments	Reference
1. AE –Inpatient hospitalisation	IOM 2.9-3.7%	Calculation of patients affected	Multiply annual DC * IOM estimates	IOM report 2000
2. AE during hospitalisation ↑ LOS	AHRQ study showed ↑ ALOS 5.5 days	Calculation of excess patient days	Multiply result from #1 to AHRQ estimates	JAMA 2003.
3. AE during hospitalisation Cost of ↑ LOS	Cost of delivering care in various settings ICU etc	Calculations of costs due to AE's	Multiply costs by excess patient days in various settings	Cost Data
4. AE's –following discharge	12% of pts experience AE post DC	Calculations by study estimates	Multiply annual discharges by study estimates	Gandhi, T., Annals of internal medicine 2003
5. ADE's during hospitalisation	Bates et al 6% ADE, 28% preventable	Calculation of pts affected	Multiply DC by study estimates	JAMA 1995
6. ADE resulting in ↑ LOS	Classen ADE led to ↑ LOS 1.74 days	Calculation of ↑ LOS due to ADE's	Multiply result of 5 to study estimates	Jama 1997
7. ADE during hospitalisation – cost of ↑ LOS	Cost in various settings	Calculations of costs due to ADE's	Multiply costs by ↑ patient days in various settings	Cost data
8. Professional liability	Litigation & indemnity payouts etc	Calculation of potential claims avoidance in \$		
9. Staff retention	Turnover costs	\$ saved by not having to retrain staff		
10. RCA costs	RCA time	Staff time involved in RCA's		

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Episode Num.	Record
URN	Name

Field Name	Episode Value
Admit Consultant Specialty	C/S
Admit Consultant Days	9
Discharge Consultant	0168687C/S [Chard Richard]
Discharge Consultant Specialty	C/S
Discharge Consultant Days	9
Qualified Separations	0
Qualified Days	0
Unqualified Separations	0
Unqualified Days	0
Merged Admissions	0
Total Cost	33272.04
Direct Cost	25954.73
Indirect Cost	7317.31
WTD Steps	5.19
Current Inpatient Flag	F

DRG Code	Version
F07Z [Othe...	4.2
F07B	5

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Standard Reports - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media

Standard Reports

Show Menu >> Custom Reports

	Measures>	↔ Separations_Aims	Avg Cost by Component
	CostComponent>	All CostComponent	
PatientIncidentStatus	↕	↕	↕
All Patient Incident Status			
Patients with Incident	↔	465	\$29,229.35
Patients without Incident	↔	13,332	\$3,594.52
Total:All Patient Incident Status	↔	13,797	\$4,458.49

PatientIncidentStatus: Total

Legend: Patients with Incident (Blue), Patients without Incident (Purple)

Done Local intranet

Start [Taskbar icons] 1:47 PM

Learning from RCAs

The characteristics of a strong and proactive safety culture include the commitment of the leadership to discussing and learning from errors, documenting and improving patient safety, encouraging and practicing teamwork, spotting potential hazards, using systems for reporting and analysing adverse events and celebrating workers as heroes improving safety rather than villains committing errors”

Pronovost et al Qual Saf Health Care 2003; 12:405-410

