Exploring the clinical opportunities of ABM: Evaluating models of care for improved efficiency & provision of care

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The SCHN Transformation of ABF to ABM

The ABF plan

1. Governance
   - Implementation Committee
   - ABF Working Group
   - Dedicated resourcing
2. Communication
   - Initial Exposure
   - Formal Education Plan
3. Improvement
   - Activity capture (counting)
   - Clinical documentation (classification)
   - Patient level utilisation data (costing)

The ABM plan

1. Governance
   - Implementation Committee
   - ABF Working Group
   - Dedicated resourcing
2. Communication
   - ABF Education Material
   - Patient Data Reviews
3. Improvement
   - Benchmarking (clinical variation)
   - Service Utilisation Review
   - Dynamic & Portable Information
   - Predictive & Prescriptive Analysis

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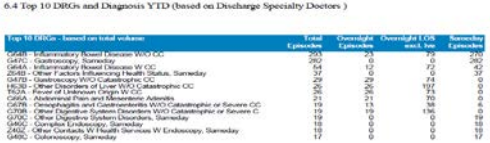
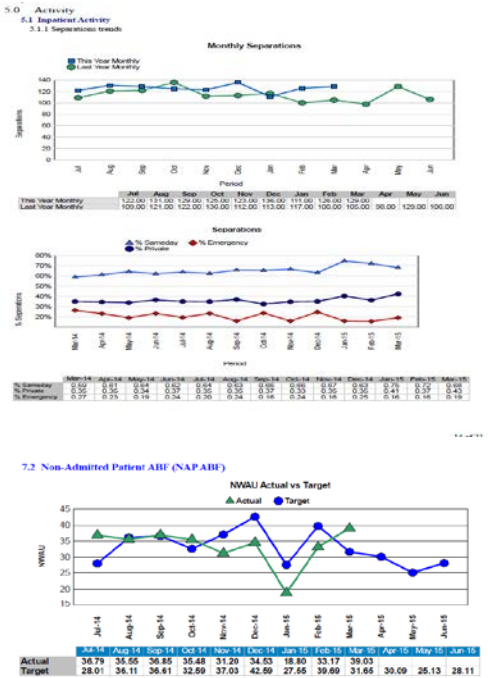
What do Patient & Families want?

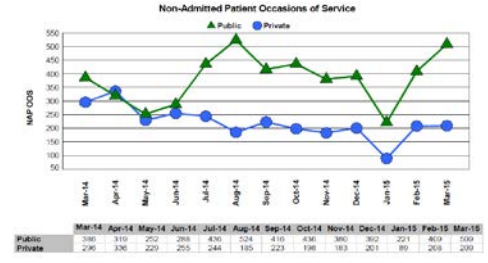
How can we apply the principles of ABF to explore the opportunities for improved efficiency & provision of good quality care.

ABM Discussions with Clinical Teams

- Review activity information – Children's Hospital Information Management Portal (CHIMP)
- Identify areas for improvement such as data capture specificity, coding, classification
- Ensure activity and cost information reflects what has occurred
- Review benchmarking data - ABM Portal
- Does it reflect what is happening in clinical practice?
- Where do costs vary and why compared to peers?







Discussing Data Solutions to Business Problems

Business Problem

1. Can we improve hospital avoidance measures?
2. What does a best practice health pathway look like for asthma?
3. How can we streamline MRI services to facilitate neurosurgery on the day of admission?
4. Can we safely perform T&As on a same day basis?

Clinical Engagement

1. What type of conditions are potentially avoidable?
2. What are the measures of "best practice"?
3. What is the history of how this service has operated in the past?
4. What are the considerations for "patient safety"?

Data Solution

1. How do readmission rates in ED compare to peers? Where others are better, what is the difference in clinical management?
2. How well does current practice align with "best practice". Where might we need to do things differently?
3. What does the MRI schedule look like? How might it need to be configured differently to streamline services?
4. What are the known dependencies which may impact patient suitability for same day discharge?

Joint Initiatives. Common Goals.

Clinical Program Leaders, Clinical & Finance Partners (Business Managers), Clinical Department Heads, Performance Unit

Data Availability from the Costing Function of ABF

Clinical Costing Systems are in place for all States & Territories

- Requirement for the derivation of costs which inform IHPA pricing.
- National costing standards are followed.

Power Performance Manager (2) is used within NSW

- PowerHealth Solutions product.
- All information used in the costing process is derived from core health systems:
  - Financials,
  - Patient Management Systems,
  - Service Provider Systems including theatres, pathology, imaging, allied & pharmacy.
- Assembled information creates a picture of a “patient journey”.
- Each component of the journey also has a cost assigned.
- NSW MoH have standardised many data elements, facilitating improved comparison between hospitals.

PPM Building the Patient Journey

Female, Aged 15, LOS 2 days
Operation Performed: Strayer calf lengthening, Split anterior tibial tendon transfer (SPLATT)
Diagnosis: Acquired clawhand, clubhand, clawfoot & clubfoot, ankle & foot
Procedure: Single event multilevel surgery, involving multiple soft tissue of the lower limb, unilateral
DRG I27A: Soft Tissue Procedures +CC

22nd August 2014

- Admitted to Orthopaedic Ward under Dr Jones, Orthopaedic Specialty at 8:14am
- Went to theatre at 11:53am. Under General Anaesthetic (Dr Smith) for 158 minutes, procedure time took 84 minutes & spent 123 minutes in recovery.
- Seen by Sally from the Orthotics team for 15 minutes at 1:45pm whilst in recovery

23rd August 2014

- Orthopaedic Ward, same doctor
- Seen by Sally from Orthotics again at 9:15am for 15 minutes.
- Seen by John from Physiotherapy for an hour at 10am.
- At 4:25pm pharmacy dispenses 20 units of Oxycodone

24th August 2014

- Still in Orthopaedic Ward, same doctor
- Seen by John from Physiotherapy for 40 minutes at 8:05am
- Discharged at 10am

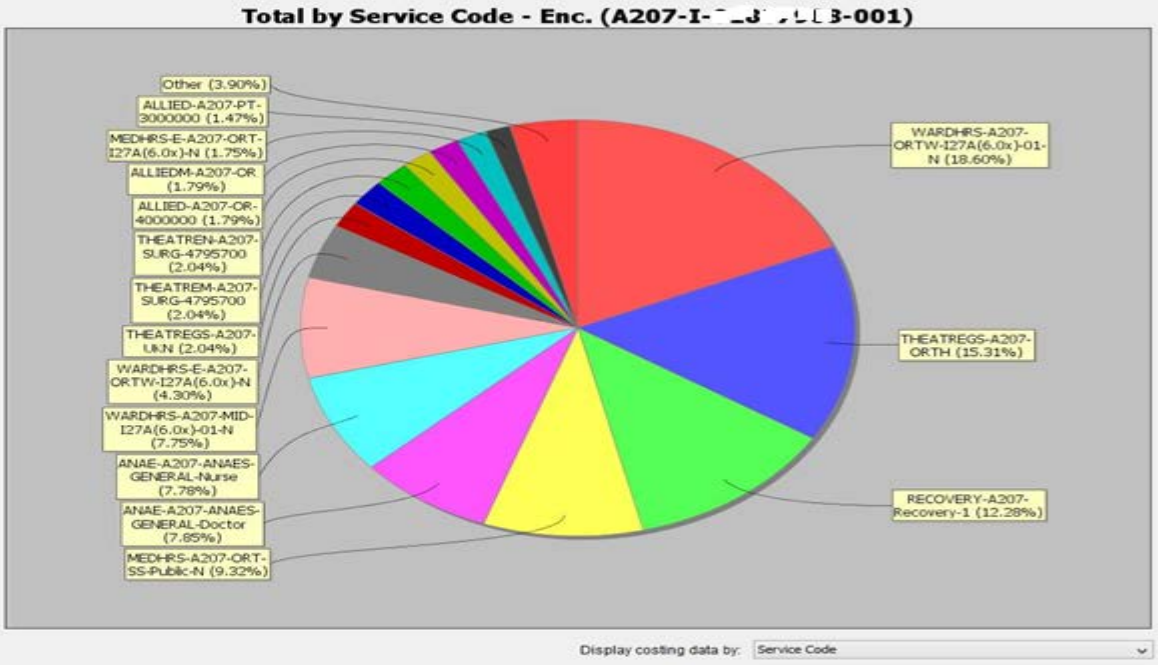
Patient: Age 15, LOS 2 days
DRG I27A: SOFT TISSUE PROCEDURES +CC

Total Cost

$6,586.09

Direct: $5,347.48
Indirect: $1,238.60

Service Code	Amount
ALLIED-A207-OR-4000000	$117.65
ALLIED-A207-OT-3100000	$40.40
ALLIED-A207-PT-3000000	$96.96
ALLIEDM-A207-OR	$117.65
ALLIEDM-A207-OT	$40.40
ALLIEDM-A207-PT	$96.96
ALLIED-PS-C-A207-I27A(6.0x)	$31.71
ANAE-A207-ANAES-GENERAL-Doctor	$517.16
ANAE-A207-ANAES-GENERAL-Nurse	$512.65
MEDHRS-A207-ORT-SS-Public-N	$613.75
MEDHRS-E-A207-ORT-I27A(6.0x)-N	$115.32
PHARMD-A207-Inpatient-2537	$47.64
RECOVERY-A207-Recovery-1	$808.46
THEATREGS-A207-ORTH	$1,008.07
THEATREGS-A207-UKN	$134.27
THEATREM-A207-SURG-4795700	$134.27
THEATREN-A207-SURG-4795700	$134.27
WARDHRS-A207-MID-I27A(6.0x)-01-N	$510.41
WARDHRS-A207-ORTW-I27A(6.0x)-01-N	$1,225.05
WARDHRS-E-A207-ORTW-I27A(6.0x)-N	$283.04



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Pathology Study

Project Team

- Chaired by the Head of Respiratory Medicine.
- Clinical representation from Emergency, General Medicine, Intensive Care, Biochemistry, Pathology.
- Supported by the Director of Clinical Integration and the Performance Unit

Aim

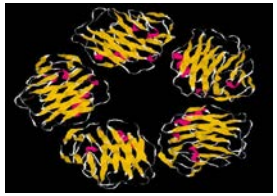
- Explore the ordering of specific pathology tests at CHW to identify and address inappropriate ordering contributing to high expenditure.

Outcome

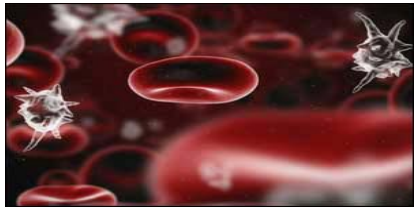
- Defined a process of ensuring that clinically irrelevant pathology testing is reduced, improving resource utilisation and patient care.

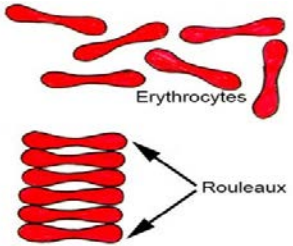
Pathology Analysis

- Three selected pathology tests were targeted based on a combination of factors including activity growth, test cost & clinical relevance. They were:
  - C Reactive Protein (CRP)
  - Procalcitonin (PCT)
  - Erythrocyte Sedimentation Rate (ESR)



- An extract from PPM provided information on:
  - When during the patient's stay tests were ordered
  - Who ordered the test (clinician)
  - For what patient conditions (diagnostic attributes)
  - Where the test was ordered (location)





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C-Reactive Protein (CRP) Test

- CRP is a test which measures the concentration in blood serum of a special type of protein produced in the liver which is present during episodes of acute inflammation.
- It is often used as a surrogate for infection.
- Its value is as a general indicator, not specific ie a positive result will indicate that there is inflammation but not cause.
- The test is used in high volumes, however it is quite cheap.
- CRP should be done 12 or more hours after illness onset – as it takes this amount of time for the protein to elevate.

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If the timing of the test is correct, there should not be a need to repeat it.

CRP Results

Patient Types & Order Location

- 80% of CRP tests were for inpatients (34% occurred on the first day of stay)
- Of the patients who had CRP tests on the first 2 days of their stay, the majority were in the Short Stay Ward (SSW), Emergency Cubes (EC) and Day Stay ward (TUDS)
- 9% of tests were for Outpatients
- 11% for patients in ED

Test Frequency

- 46% of patients had one CRP test during their stay (78% of these had the test on Day 1)
- The number of tests ordered per patient ranged from 1 to 18 tests per stay

Number of tests per patient	Count
1	340
2	55
3	23
4	12
5	9
6	1
8	1
9	1
10	1
17	1
18	1

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Snapshot of CRP Test Ordering per Episode

Episode Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	32	33	34	35	36	37	38
20857696																									1	1	1	1	1	1			1		1	2	2
20861357	1		1	1	1	1		1					1	1	1		1	1	1	1	1		1	1	1												
20861623	1		2		1			1		1				1		1		1	1																		
20861610	1					1	1				2	1				1	1						1														
1570353			1			1	1			1	1		2		1																						
20852718																																					
1556978							1				1	1		1					1																		
1541749																																					
1554617				1			1		1	1				1																							
1556385														1	1	1	1																	1			
20862957	1		1		1		1			1																											
1563157	1	1	1	1	1																																
20863453		1	1	1							1		1																								
1569181	1			1		1				1		1																									
20860520			1	1					1		1													1													
20862410	1		1	1							1																										
20858926																2						1	1														
20863659		1		1			1		1																												
1565696						1			1				1			1																					
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20862895	1			1				1																													
20862105	1					1			1																												
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1511950							1		1		1																										
20862525	1	1			1																																
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1571938						1		2																													
20862788				1	1	1																															
1573618		1					1		1																												
20863027		1	1		1																																
1538616									1			1			1																						
20863482	1							1	1																												
1560369										1		1																			1						

Episode Number	39	40	41	42	43	44	47	48	49	50	51	54	57	58	60	62	64	66	67	69	70	71	72	74	75	76	78	81	83	84	85	87	88	109	114	116	120	121	352	Grand Total
20857696		1			1		1	1		1	1																													18
20861357																																								17
20861623																																								10
20861610																																								9
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1541749	1		1	1	1	1																																		5
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CRP Ordering Patterns by Doctor and Specialty

	Specialty																	
Doctor	MED	SUR	ONC	END	NEP	ORT	HAE	NEO	REN	G/E	NEU	CAR	N/S	AMU	URO	GAS	ENT	Grand Total
!UNKNOWN!	4	14	6	2	5	3		1							1			36
A	5	5	3	1	2			1										17
B	6	1		1		1	1											10
C	2	4					1				1	1						9
D		3	2	1			1						1					8
E	2			3					2									7
F	1	1	3							2								7
G	1	2	2	2														7
H	2			2		1								2				7
I	3	1	3															7
J	2	5																7
K		2		2							1							5
L		2	1	1			1											5
M	3	1																4
N	2		1							1								4
O	2		1	1														4
P	1		2	1														4
Q		1										2						3
R	2		1															3
S	2	1																3
T	1		1	1														3
U	1	1															1	3
V	3																	3
W	1	2																3
X		1	1															3
Y	1		1										1					3
Z	2		1															3
AA	1		2															3

Tests by Top Principal Diagnosis & Procedure code

- CRP tests were conducted on patients spanning 240 primary diagnosis codes. The highest counts were for patients with:
  - Acute appendicitis
  - Osteomyelitis
  - Complications of procedures (not elsewhere classified).
- CRP tests were carried out on patients spanning 117 primary procedure codes.

Primary Diagnosis	Count
T81 Complications of procedures NEC	28
K35 Acute appendicitis	26
M86 Osteomyelitis	24
A41 Other sepsis	24
J21 Acute bronchiolitis	24
K50 Crohn's disease [regional enteritis]	21
R10 Abdominal and pelvic pain	20
B34 Viral infection of unspecified site	19
J18 Pneumonia organism unspecified	18
M08 Juvenile arthritis	15
E66 Obesity	11
T85 Comp oth internal prosth dev impl gft	11
D69 Purpura & oth haemorrhagic conditions	10
L03 Cellulitis	10
M25 Other joint disorders NEC	10

Row Labels	Count
9555000 Allied health intervention, dietetics	46
9619900 IV admin of pharmac agent antineoplastic	44
1370600 Allo bm/sc trnsplnt rel don wo in vitro	28
3057200 Laparoscopic appendicectomy	26
9022500 Extracorporeal membrane oxygenation	18
4930300 Arthrotomy of hip	18
9090100 Magnetic resonance imaging of brain	18
3022300 Incision & drainage of haematoma of SSCT	15
1383900 Collection blood for dx purposes	15
3047300 Panendoscopy	14
3880600 Insertion intercostal catheter for drain	14
9220900 Management NIV support <= 24 hours	12
1388200 Mgmt contin ventilatory sup <= 24 hours	11
4000900 Revision of ventricular shunt	11
9207900 Replace tube/enterostomy dev, sm intest	9

CRP Tests & Results

Patient 1: 13 year old boy, LOS 139 days.

Presented through ED with Urticaria and Hip Pain

	Day of stay																														
Epsiode No.	Days 1 - 24	25	26	27	28	29	30	32	33	34	35	36	37	38	39	40	41	42	43	46	47	48	49	50	51	Days 52-62	63	64	Days 65- 139	Total Tests
20857696		1	1	1	1	1	1			1		1	2	2		1			1		1	1		1	1					18
	PICU										CC																ORTW		CC	
CRP Result		89.4	88.5	140.9	159.1	131.4	62.3			73.6		79.6	60.7	86.9		77.9			120.5		171.8	218.5		147.0	256.7					

Patient 2: 14 year old girl, LOS 31 days. Tx to other hospital.

Presented through ED with Renal Failure

	Day of stay																														
Epsiode Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total no. tests
20861357	1		1	1	1	1		1					1	1	1		1	1	1	1	1		1	1	1							17
	SSW	CY															WW															
CRP Result	620.8		245.8	139.6	64.2	61.6		87.4					28.0	19.3	16.3		33.6	31.9	59.1	66.9	45.1		22.6	26.1	19.4							

Study Conclusions

- Need for better Engagement/Training/Support of Junior Staff was noted. Guidelines developed for ED.
- Value of pathology testing was questioned where the result will not impact patient management.
- Judgement on clinical presentation needs to be made together with test results.
- Procalcitonin (PCT) results often correlate with CRP.
- Studies show Procalcitonin (PCT) is a better indicator of serious infection than CRP (but is more expensive). New process established for ordering PCT tests – resulted in stabilisation of test numbers.
- Erythrocyte Sedimentation Rate (ESR) results often correlate with CRP.
- ESR is cheap but sensitivity & specificity are questionable (high plasma proteins can affect the result). Reviewing the requirement to order both CRP & ESR together.

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Service Utilisation Review

Completed Studies

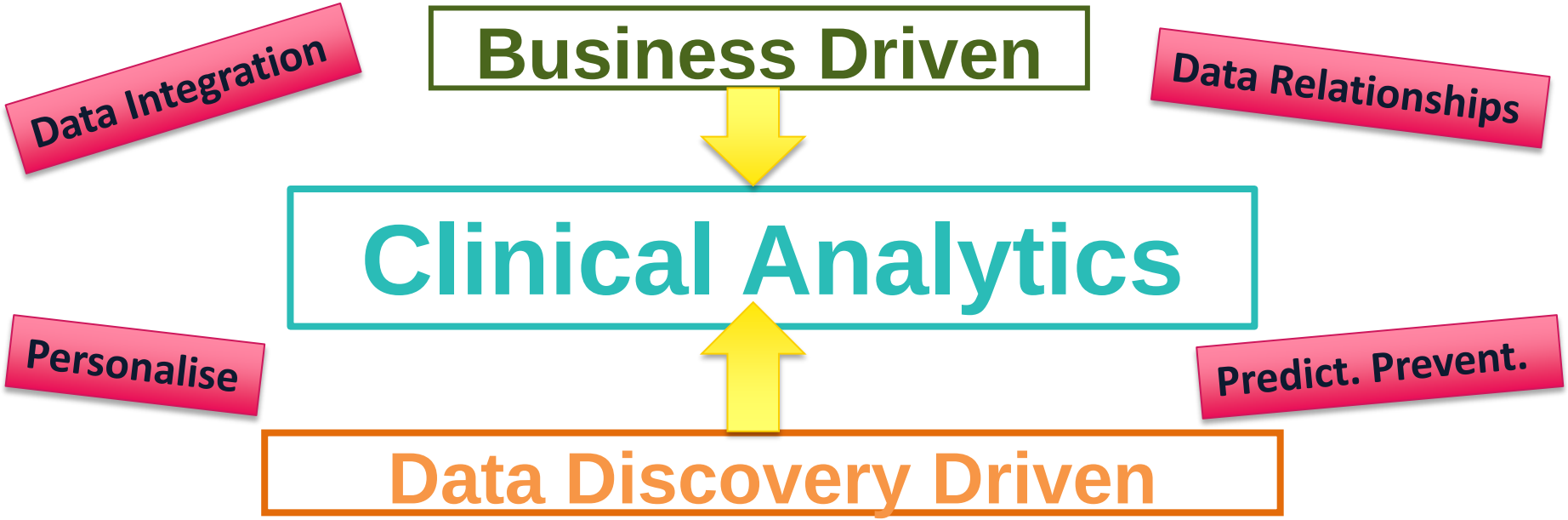
- Review of chest xrays & blood gases for patients presenting to ED.
- Test ordering patterns by Medical Team.
- Impact of new treatment protocols.
- Variation in outcomes by clinical specialty.
- Requirement for ultrasound out of standard hours.

Using algorithms derived from statistically proven relationships, we can pro-actively alert providers to the possibility of patient risk or poor performance.

Future Thinking

- Interventions and their relationship to outcome.
- Review of workflow & practices. Where are we spending money with no practical benefit to patients?
- Alignment of critical tasks with reporting. What are the “creeper” issues.
- Overlay of workforce & activity data.
- Adherence to protocols, models of care.

The Science of Improvement



"There are two possible outcomes: if the result confirms the hypothesis, then you've made a measurement. If the result is contrary to the hypothesis, then you've made a discovery".
Enrico Fermi

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