HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND

Kupu Taurangi Hauora o Aotearoa



Australasian College for Infection Prevention and Control 2016 CONFERENCE





SSII Surgical Site Infection Improvement Programme

The New Zealand Surgical Site Infection Improvement Programme: A Quality Improvement Programme Supporting Systems-based Practice Change

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No Conflicts to Disclose





Outline

- New Zealand district health boards
- Health Quality & Safety Commission
- IPC programme
- SSIIP
 - Quality & safety markers
 - Successes & barriers
 - Future work







New Zealand 20 District Health Boards







Best value for public health system resource

NZ Health Quality & Safety Commission

- Formally established under the NZ Public Health & Disability Act 2010
- Triple Aim:
 - Improved quality, safety and experience of care
 - Lead quality improvement activities
 - Provide accurate and consistent SSI measurement and reporting via National Monitor
 - Drive culture and behaviour change
 - Improved health and equity for all populations
 - Reduction in SSI rates
 - Better value for public health resources
 - National monitor as data warehouse





SSIIP data captured

- Patient identification
 - NHI and DHB-specific case form number
- Patient demographics
 - Age (date of birth), gender, ht, wt and BMI
- Admission and discharge (or date of death) dates
- Procedure
 - Code, location, primary or revision, emergency, surgeon grade, surgeon code
- Risk score
 - Wound class, length of surgery, ASA score

- Anaesthetic
 - Type given
- Antibiotics
 - "right drug, right dose, right time"
- Skin preparation
- Readmission within 90 days of the procedure
- SSI
 - Timing
 - Type of SSI (NHSN definitions)
 - Microbiology







Approach to improvement

- Clinical and executive leadership
- Multidisciplinary teamwork
- Consumer engagement
- Evidence-based improvement interventions
- Effective use of data national & local reports
- Publicly reported quality & safety markers
- Appropriate improvement methodology used
- Regional networking to share successes and sustain practice improvement





Consumer engagement



What can you and your family/ whanau do to help prevent SSIs?

Before your operations:

- tel your doctor about other health problems you might have, such as diabetes – these could affect your surcery and your treatment
- If you smoke, talk to your doctor or ask to be referred to your local smoking cessation programme for support to stop smoking before your surgery – padents who smoke get more infections
- don't shave where you will have surgery.

At the time of your operation:

- speak up if someone tries to shave you with a razor before surgery. Ask why you need to be shaved rather than dipped
- ask if you will get antibiotics before surgery.

What are hospitals doing to prevent SSIs?

To prevent SSIs, doctors, numes and other health care staff.

- clean their hands and arms up to their elbows with an antiseptic just before the operation
- wear hair covers, masks, gowns and gloves during the operation to keep the surgery area clean

 remove your hair around the operation site using electric clippers – not a ratii, which could initiate the skin and make it easier to develop an infection

- give you antibiotics before your surgery starts
- clean the skin at the operation site with an antiseptic that kills bacteria (germs)
- clean their hands with soap and water or an alcoholbased hand rule before and after caring for you and other patients.

National Patient Safety Campelign Opeon Fich Bitter Call

Preventing infection after surgery









SSII Programme process measures

- Antibiotic prophylaxis given on time
 - 0-60 minutes before knife to skin
- Correct dose of recommended antibiotic
 - cefazolin 2g <u>or</u> cefuroxime 1.5g
- Alcohol-based skin preparation
 - with chlorhexidine or povidone iodine
- Additional interventions encouraged but not reported as QSM
 - Clipping not shaving the surgical site
 - Duration of post-operative surgical antibiotic prophylaxis







'On time' antibiotic

prophylaxis Figure 8' Process marker, cercentage of operations where antibiotic given 0-60

Auckland DHE	97-	-98	- 98	96	96	-97	- 96 -	95	96	95	- 94
Bay of Plenty DHB	9 5-	- 92-	95	-97-	-95	- 97	- 98	99	-99-	-96	-99
Canterbury DHB	84	-96	97	- 96-	-94	- 99	-97-	100	100	-98	- 99
Capital & Coast DHB	93-	96	- 83	- 98 -	95	39	90	-00	133	00	100
Counties Manukau Health		0	- 08	- 53-	-94	97	99	97	97	98	24
auora Talrawhiti	91	- 91	88	-18-	88	- 95	-95	95	-00	-91	-07
Hawke's Bay DHB	-99	-87	-95	93	100	98	00	100	0)	-98	-100
lutt Valley DHD	99-	87	53	87	94	.60	95	-97	98	-94	- 98
akes DHB	98-	-98	-99	-98-	100	- 69	- 99	-98-	-97-	100	-97
WidCentral DHB	91-	94	96	- 39	97	- 96	90	100	-99	98	- 93
Velson Marlborough DHB	92-	-87		-99	100	- 98	-97-	- 99	-96	-99	10
Northland DHB	98-	89	- 98	-97	96	- 96	-83-	-91	92	98	-93
South Canterbury DHB	93	- 64	85	100	100	100	-00	100	96	100	-10
Southern DHB	70-	65	00	-91-	92	- 60-	- 92	93	- 82	- 90	-97
Faranaki DHB	93	91	100	-97	98	- 90	95	8	64	80	10
Walkato DHB	85-	-98	- 89	- 87-	- 63	-83	- 63-	92	94	-07-	-03
Wairarapa DI ID	97	100	130	-97-	100	- 96	0.0	100	100	-95	10
Waitemata D∺B	93-	-92	.95	-96-	-98	-97	-97-	94	-98	-96	- 92
West Coast DHB	87-	-94	100	- 89 -	100	100	-96	100	93	-100-	-10
Whanganui DHB	69	.94	- 88	100	100	-00-	100	100	-00	100	10
New Zealand	93-	69	- 93)	-94	96	- 95	96	96	-97	97	-97
	2313	2013	2314	2314	2014	2314	2015	2016	2015	2315	2016
	33.	Ř	ā	22	33	2	5	5	33.	4	5

<u>Mar</u> <u>Sep</u> 2016 Intervention <u>Diff</u> <u>2013</u> **Patients** receiving antibiotic on time for 89% 97% +8% primary procedure (within 60 mins of knife to skin) **Patients had** surgical antibiotic prophylaxis 96% +40% 56% stopped within 24 hours of surgery



Upper group Middle group Lawer group



Correct dose of antibiotic

Figure 9: Process marker, percentage of operations where 2g or more cefazolin or 1.5g or more cefuroxime given

Auckland DHB	85	- 93	96	95	95	97	100	93	95	94	94		6	D.C. a. a.
Bay of Plenty DHB	73-	- 93	93	96	95	99	- 99	95	99	97	98		<u>Sep</u>	<u>Iviar</u>
Canterbury DHB	52	56	-70-	-91	96	97	97	93	95	96	96	Intervention	<u>2013</u>	2016
Capital & Coast DHB	100	90	97	98	99	98	98	93	100	99	69			
Counties Manukau Health		97	93	98	99	99	100	100	166	100	97	Patients		
Hauora Tairav/hiti	96	92	90	96	92	98	97	93	100	97	- 97	receiving the		
Hawke's Bay DHB	10	36	60	6	- 85	- 89	93	97	99	94	97	receiving the		
Hutt Valley DHB	٥	90	96	99	94	100	100	100	99	97	97	correct dose		
Lakes DHB	93	95	96	95	95	99	97	96	95	98	97		63%	96%
MicCentral DHB	2	0	3	4	8	10	96	100	99	95	96	of antibiotic		
Nelson Mariborough DHB	26	70	93	99	99	97	100	99	99	100	- 97	before		
Northland DHB	56	-90-	95	98	94	93	96	95	93	98	100			
South Canterbury DHB	76	-51-	97	94	93	95	95	94	96	92	95	surgery		
Southern DHB	23	45	65	-81-	-77-	81	- 39	93	95	94	96			
Taranaki DHD	15	21	16	29	39	43	31	63	51	53	69			
Waikato DHB	74	78	88	93	94	95	90	93	94	94	96			
Wairarapa DHB	97	100	94	97	100	94	100	100	100	95	100			
Waitemata DHB	66	72	-82-	97	96	98	97	94	97	95	- 94			
West Coast DHB	13	61	_30	100	100	100	96	160	95	95	130			
Whanganui DHB	g	67	- 95	94	95	99	100	92	93	99	100			
New Zealand	55-	70	80	86	85	- 90	95	95	95	96	- 96			
	013	013	014	014	014	014	016	015	015	015	016			
	1	4	1	N N	3	4	1	N	3	4	1, 2			
	Ø	Ø	Ø	O	O	C	o	0	C	a	O		C	CITT





Diff

+33%

HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND Use of alcohol-based skin prep

Figure 10: Process marker, percentage of operations given appropriate skin preparation

Waitemata DHB	95-	97	100	93	98	99	99	100	130	100	-10)				
Wairarapa DHB	97-	100	91	100	97	100	100	100	130	100	-98				
Waikato DHB	95	98	-92	-83	-84	86	-95	98	130	100	-99				
Taranaki DHB	63-	68	-100-	-100-	100	100	100	99	130	100	-99				
Southern DHB	58-	96	93	97	-99	99	-97	98	97	99	100				
South Canterbury DHB	100-	100	100	100	100	100	130	100	130	100	-10)				
Northland DHB	100-	100	100	100	100	100	100	100	130	100	100				
Nelson Marlborough DHB	100	100-	-100-	100	100	100	-00-	100	100	100	-10)	antisepsis			
MidCentral DHB	98-	100	-100-	100	100	100	130	-97-	-99	98	-99	Dased Skin			
Lakes DHR	100-	100	100	-93	100	100	-00	- 99	100-	100	100	bacad alvin	97%	99%	+2%
Hutt Valley DHR	100-	100-	- 93-	-100-	100	100	-100	100	100-	-100-	-100	an alcohol-			
Hautora Tairawhiti	100-	-00	-100-	97	-100	-99	-100-	98	100	-100-	-100	Patients had			
Counties Manukau Heath	100-		100	-100-	-100	-100-	-00-	100	-170-	-100-	-00	Detions had			
Capital & Coast DHB		83	93	89	-97-	- 99	- 68	- 99-	- 69	- 99	- 99	Intervention	<u>2013</u>	<u>2016</u>	<u>Diff</u>
	100	-00	-100-	100	-00	-106	-00-	100	-130	-100	-103		<u>Sep</u>	<u>Iviar</u>	
Bay of Plenty DHB	00	-00	-000	100	- 00	00	-00	100	130	100	100		•		
and the second second second second	62	00	00	100	00	400	610	100	120	4000	00				

vilda e group Lower group





Outcome measure: Hip and knee SSI rate (Jun 2013-Jun 2016)











*Draft figures



National Knee SSI Rates (April 2014 - June 2016) 1.8% 1.6% 1.4% 1.2% SSI Rate 1.0% 0.8% 0.6% 0.4% 0.2% 0.0% Q2 2016^{*} Q2 2014 Q3 2014 Q4 2014 Q1 2015 Q2 2015 Q3 2015 Q4 2015 Q1 2016 •% Knee SSI

# SSI	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016*
Total	13	19	10	12	9	11	3	13	8
Superficial	9	9	3	2	4	7	1	4	2
Deep & OS	4	10	7	10	5	4	2	9	6

*Draft figures

Risk Factors for SSI

Risk Factor	Significance	Odds ratio (95% confidence intervals)
Surgeon-specific		
1. Expertise (consultant vs registrar)	NS	
Procedure-specific		
1. Unilateral vs bilateral procedure	NS	
2. Revision procedure	P <0.001	3.1 (2.2-4.1)
Patient-specific		
1. Overweight (BMI >25-30)	NS	
2. Obese (BMI >30)	P <0.004	1.9 (1.23-3.05)
Surgical antimicrobial prophylaxis		
1. Addition of gentamicin to	NS	
cephalosporin		
2. Administration of prophylaxis >	P=0.002	2.2 (1.3-3.6)
60mins before knife to skin (KTS) or		
after KTS		
Skin antisepsis		
1. Alcohol-based skin preparation	P=0.04	0.67 (0.47-0.97)
povidone iodine vs chlorhexidine		





Financial benefits

- Excess cost avoided due to length of hospital stay required to manage infection
- August 2015 June 2016 (NZ \$)
 - ~\$40,000 avoided per SSI prevented¹
 - 37 fewer SSIs have occurred in 11-month period between Aug 2015 to June 2016
 - ~\$1,480,000 costs avoided
- March 2013 June 2016 – ~\$14.4M cost of orthopaedic SSI

¹Gow N, McGuinness C, Morris AJ, et al. 2016. Excess cost associated with primary hip and knee joint arthroplasty surgical site infection: a driver to support investment in quality improvement strategies to reduce infection rates. *New Zealand Medical Journal* 129(1432): 51–8. URL: <u>https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2016/vol-129-no-1432-1-april-2016/6848</u>



Where SSIIP is now ...

- Good engagement in all 20 DHBs
- Quality improvement central focus
- Multidisciplinary approach
- Significant improvement in orthopaedic QSM
- Starting to see improved outcome measure
- Significant improvement in dose of antibiotic given
- Variation in duration of postop antibiotic prophylaxis
- Cardiac programme growing
- Results are posted on the Commission website at: <u>www.hqsc.govt.nz</u>







Key learnings so far

- Executive sponsorship is vital
- Multidisciplinary teams are needed for a QI approach:
 - management, clinical, quality, IPC, IT, consumers
- Start with sustainability in mind
- Identify barriers/local solutions consider the FLO approach – no one person can change culture alone







Local barriers to engagement

Issues particular to SSIIP:

- Time involved in manual data capture
- Limited engagement with IT departments in DHBs

Issues similar to other improvement initiatives:

- Lack of senior executives actively involved
- Teams working in silos (lack of multidisciplinary approach)
- Local 'ownership' of improvement not created







Looking forward

- Working in partnership with Accident Compensation Corporation (ACC)
- Increase in automated data collection a priority
 - Support DHBs to build case for investment in IPC IT surveillance system
- Building quality improvement capability key to ensuring sustainability
- Ensuring consumer engagement at all levels of the programme
- Establishing a firm foundation for the SSI 'hub' in the longterm including possible spread to:
 - private providers/hospitals
 - other surgical procedures
 - New interventions (anti-staph bundle)





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