GIRFT SSI National Survey

APRIL 2019

GETTING IT RIGHT FIRST TIME

CONFIDENTIAL - NOT FOR EXTERNAL CIRCULATION

Foreword from Professor Tim Briggs

I am delighted to present this report on the first Getting It Right First Time (GIRFT) Surgical Site Infection (SSI) National Survey. It is being circulated to all NHS trusts in England to present the high-level results from the survey. The 95 trusts which took part in the survey have received their individual results and feedback separately.

SSIs can lead to increased morbidity and mortality in patients following any surgical procedures and are associated with delayed discharges, readmissions and re-operations. This could result in hugely varied patient experience post-operatively and impose a significant cost to the NHS.

During our national review of all surgical departments across England, we noticed the lack of awareness of their own SSI rates by some frontline clinicians. Consequently, the GIRFT SSI programme was set up to review SSI rates in surgical units in England and to review the current practice in prevention of SSIs.

The GIRFT SSI National Survey has reviewed SSI rates across 13 surgical specialties and involved doctors in training in the data collection process. SSI data were submitted by 95 NHS trusts encompassing 198 surgical units in England. Such level of engagement for a programme in its first year of implementation reflects the desire of clinicians to ensure better care is delivered for patients. It is only with accurate reporting of SSI rates that we can start to understand the impact of variation in surgical practice, and start to drive changes leading to service improvement.

GIRFT cannot succeed without the backing of clinicians, managers and all of us involved in delivering care. It is our responsibility to deliver better surgical care to our patients, working together to reduce SSI rates and unwarranted variation.

Professor Tim Briggs

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Surgical Site Infection

What is a surgical site infection?

A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where surgery took place. SSIs can lead to increased morbidity and mortality in patients who have received a surgical procedure. SSIs are associated with delays to patient discharge, readmissions and re-operations; and can result in increased hospital costs for staffing, diagnostics and treatment.

It is recommended that surgical units monitor their own SSI rates and contribute to national surveillance of SSI in order to inform and influence clinical practice to reduce the risk of SSI. By monitoring and reporting SSI rates, clinicians can share recent data with patients when discussing their procedure to ensure that patients are informed when consenting for surgical procedures.

The GIRFT SSI Programme

In April 2017, the GIRFT SSI programme was launched to review SSI rates in surgical units in England. The objectives were for front-line clinicians to:

1) collect data and review the rates of SSI within their surgical unit;
2) examine the likelihood of significant complications developing following SSIs; and
3) review current practice in the prevention of SSI.

Thirteen surgical specialties were included in the survey: breast surgery; cardiothoracic surgery; cranial neurosurgery; ear; nose and throat surgery; general surgery; obstetrics and gynaecology; ophthalmology; oral and maxillofacial surgery; orthopaedic surgery; paediatric surgery; spinal surgery; urology; and vascular surgery.

A survey was sent to all participating trusts, asking clinicians to record SSIs that developed following 65 different surgical procedures delivered between 1 November 2016 and 31 October 2017. Junior doctors were asked to record SSIs identified at their employing trust prospectively for patients undergoing an included procedure, whether the infection occurred as inpatient or post-discharge. There was no defined follow-up period for each patient. SSIs may have been attributed to the trust identifying them rather than the trust at which the primary admission took place. This contrasts to Public Health England's (PHE) approach employing quarterly data submission and active surveillance and a precise case finding approach. Similar to PHE, GIRFT uses internationally defined case definitions to classify infections, but shortened some terminology for brevity (e.g. Referring to 'deep' for deep incisional infections).[1] As cases were identified in a secondary care setting, we would expect a bias towards deep or organ/space infections, and so assume that numbers reported here are for deep or organ/space infections.

A total of 861 healthcare professionals, mostly doctors in training, registered to take part in the survey. Data was received from 95 NHS trusts, encompassing 198 surgical units in England.

The level of participation in the GIRFT SSI survey was highly encouraging for a programme in its first year of implementation. The methodology of involving doctors in training was novel, and had the additional advantage of educating future surgeons in SSI surveillance. We encouraged a sense of ownership of infection surveillance amongst surgical staff, which we expect to drive both reduction in infection rates and improved collection of data.

A list of participating trusts and surgical units can be found at the end of this document.

It is important to note that due to the relatively low volume of responses it is difficult to interpret the results with a great deal of confidence, we have therefore limited the analysis and the number of observations and recommendations. We have particularly steered clear of making observations at procedure level where the very low volumes are likely to make the results statistically insignificant.

[1] *PHE(2013) Protocol for surveillance of surgical site infection, available via: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633775/surgical_site_infections_protocol_version_6.pdf, accessed: 05/03/19*

The work we have done to date is important only in so far as it has raised the level of visibility of SSIs within providers. The pilot survey has also helped clarify how we can better focus the follow up audit (to be launched in May 2019) to concentrate on issues of specific importance and to prompt participation amongst a wider cohort of providers across all 13 specialties.

The national SSI Surveillance Service (SSISS) at Public Health England (PHE) collects SSI data submitted by NHS and independent sector hospitals in England. The current SSISS collects data on 17 surgical categories across seven specialties. Since April 2004, NHS trusts performing orthopaedic surgery have been mandated by the Department of Health to carry out surveillance for a minimum of three consecutive months per financial year in at least one of four orthopaedic categories. Participation in other categories remains voluntary. (1)

The GIRFT SSI programme aims to complement the work of PHE by engaging front line clinicians in the data collection process and exploring variation in surgical practice and outcomes for a wider range of procedures and specialties. We plan to conduct annual GIRFT SSI surveys allowing trusts in England to draw comparisons over time for procedures, including those procedures not currently included in the PHE SSISS programme.

Variation in practice

Benchmarking data

The GIRFT SSI programme aims to provide benchmarking information for trusts to review their practice and improve performance. However, it is recognised that differences in the methods and criteria utilised for identification and reporting of SSI can lead to variation in SSI rates recorded by trusts. A trust with a high quality SSI surveillance programme may misleadingly appear to be doing less well than a trust where its surveillance programme is failing to record all SSI cases.

Surgical Site Infection Rate

The GIRFT SSI survey identified significant levels of variation in SSI rates reported by surgical units, both at a specialty and procedure-level.

Figure 1. Surgical site infection (SSI) rates by specialty and procedure

Specialty/procedure (n = number of participating trusts)	Number of SSI	Total number of procedures performed	SSI rate (%)				
			Rate (%)	95% CI Lower	95% CI Upper	Minimum	Maximum
Breast Surgery (n = 38)	**148**	**1614**	**9.2**	**7.8**	**10.8**	**0**	**61.1**
Breast implant procedures	76	466	16.3	12.8	20.4	0	53.9
Procedures requiring a flap	41	463	8.9	6.4	12	0	74.4
Level 2 mammoplasty - therapeutic or symmetrising	31	685	4.5	3.1	6.4	0	61.1

Figure 1. Surgical site infection (SSI) rates by specialty and procedure (continued)

Specialty/procedure (n = number of participating trusts)	Number of SSI	Total number of procedures performed	SSI rate (%)				
			Rate (%)	95% CI Lower	95% CI Upper	Minimum	Maximum
Cardiothoracic Surgery (n = 8)	**109**	**13177**	**0.8**	**0.7**	**1**	**0**	**2.9**
Cardiac surgery - isolated CABG procedure	37	4990	0.7	0.5	1	0	1.4
Cardiac surgery - valve surgery +/- combined procedure	36	3150	1.1	0.8	1.6	0	3.7
Cardiac surgery - other (excluding transplantation)	5	608	0.8	0.3	1.9	0	4.2
Thoracic surgery - lung resection	17	2819	0.6	0.4	1	0	2.5
Thoracic surgery - other (excluding transplantation)	14	1610	0.9	0.5	1.5	0	3.7
Cranial Neurosurgery (n= 6)	**88**	**2061**	**4.3**	**3.4**	**5.3**	**1**	**14**
Cranial procedure for benign brain tumour	25	295	8.5	5.5	12.5	0	18.4
Cranial procedures for malignant brain tumour	24	489	4.9	3.1	7.3	0	11.1
Cranial procedure for trauma	0	<10				-	-
Brain shunt procedure	6	315	1.9	0.7	4.1	0	4.4
Insertion of external ventricular drain	17	324	5.2	3.1	8.4	0	38.9
Procedure performed for subarachnoid haemorrhage	10	182	5.5	2.6	10.1	0	31.6
Procedure performed for subdural haematoma	6	456	1.3	0.5	2.9	0	3.8
Ear, Nose and Throat (n= 14)	**29**	**2525**	**1.1**	**0.8**	**1.6**	**0**	**3.6**
Resections in head and neck cancer	16	1059	1.5	0.9	2.5	0	17.2
Bone anchored hearing aid surgery	0	<10				-	-
Cochlear implant procedures	1	131	0.8	0	4.3	0	2.9
Parotidectomy	4	462	0.9	0.2	2.2	0	4.3
Submandibular salivary gland removal	0	20	0	0	18.4	0	0
Thyroid surgery procedures	8	853	0.9	0.4	1.8	0	4

Figure 1. Surgical site infection (SSI) rates by specialty and procedure (continued)

Specialty/procedure (n = number of participating trusts)	Number of SSI	Total number of procedures performed	SSI rate (%)				
			Rate (%)	95% CI Lower	95% CI Upper	Minimum	Maximum
General Surgery (n= 24)	**318**	**23085**	**1.4**	**1.2**	**1.5**	**0**	**14.5**
Elective cholecystectomy	50	7099	0.7	0.5	0.9	0	2.9
Elective gastrointestinal resection	157	3629	4.3	3.7	5.1	0	18
Elective hernia repair (incisional)	20	1058	1.9	1.2	2.9	0	20
Elective hernia repair (inguinal)	13	6310	0.2	0.1	0.4	0	2
Emergency appendicectomy	57	3639	1.6	1.2	2	0	47.8
Emergency cholecystectomy	18	1334	1.3	0.8	2.1	0	9.5
Emergency laparotomy	3	16	18.8	3.9	54.8	0	18.8
Obstetrics and Gynaecology (n= 20)	**294**	**18798**	**1.6**	**1.4**	**1.8**	**0**	**4.7**
Abdominal hysterectomy	43	2544	1.7	1.2	2.3	0	7.3
Caesaraen section	251	16214	1.5	1.4	1.8	0	7.1
Ophthalmology (n= 18)	**33**	**68404**	**0**	**0**	**0.1**	**0**	**0.1**
Cataract Surgery Total	18	60193	0	0	0	0	0.1
Intravitreal Injection	15	8211	0.2	0.1	0.3	0	2.8
Oral and Maxillofacial Surgery (n= 7)	**48**	**8783**	**0.5**	**0.4**	**0.7**	**0**	**2.6**
Head and neck cancer surgery	11	290	3.8	1.9	6.8	0	8.6
Dentoalveolar surgery	26	7731	0.3	0.2	0.5	0	2.7
Surgery following trauma	11	762	1.4	0.7	2.6	0	2.1

Figure 1. Surgical site infection (SSI) rates by specialty and procedure (continued)

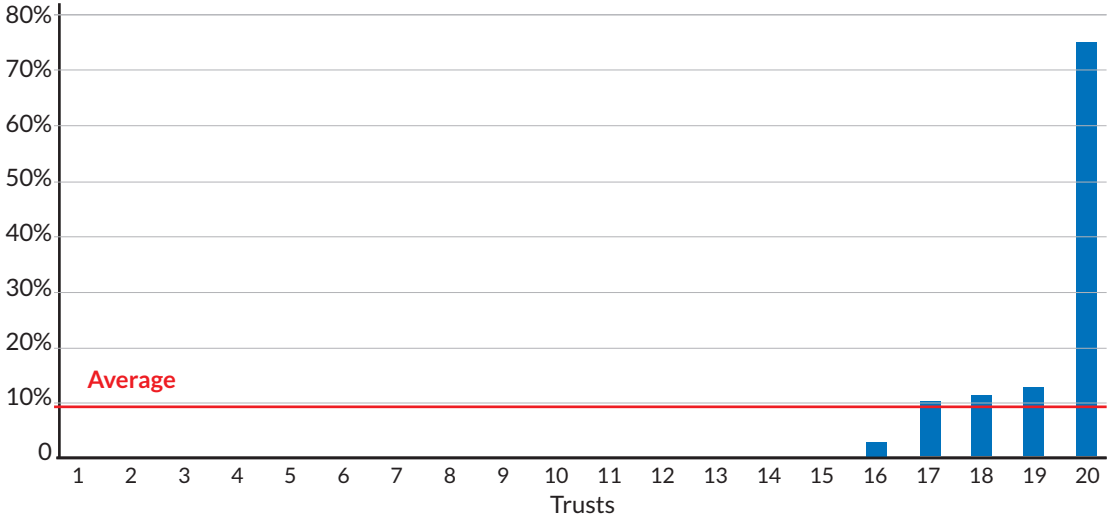
Specialty/procedure (n = number of participating trusts)	Number of SSI	Total number of procedures performed	SSI rate (%)				
			Rate (%)	95% CI Lower	95% CI Upper	Minimum	Maximum
Orthopaedic Surgery (n= 29)	**130**	**20343**	**0.6**	**0.5**	**0.8**	**0**	**12.1**
Elective primary elbow replacement	0	78	0	0	4.7	0	0
Elective primary shoulder replacement	6	888	0.7	0.2	1.5	0	3.6
Elective primary hip replacement	52	8603	0.6	0.5	0.8	0	17.4
Elective primary knee replacement	52	8968	0.6	0.4	0.8	0	2.9
Elective primary ankle replacement	0	93	0	0	4	0	0
Elective revision elbow replacement	0	<10				-	-
Elective revision shoulder replacement	0	47	0	0	7.8	0	0
Elective revision hip replacement	10	1028	1	0.5	1.8	0	5.3
Elective revision knee replacement	10	638	1.6	0.8	2.9	0	8.9
Elective revision ankle replacement	0	<10				-	-
Paediatric Surgery (n= 7)	**27**	**563**	**4.8**	**3.2**	**7**	**1.5**	**15.4**
Emergency appendicectomy	27	563	4.8	3.2	7	1.5	15.4
Spinal Surgery (n= 7)	**23**	**2287**	**1**	**0.6**	**1.5**	**0**	**3**
Posterior cervical spine decompression and instrumented fusion	3	170	1.8	0.4	5.2	0	8.1
Posterior correction of adolescent idiopathic scoliosis	0	<10				-	-
Single level discectomy or decompression (unilateral or bilateral)	8	1674	0.5	0.2	0.9	0	1.6
Single level instrumented posterior fusion (including interbody fusion)	12	443	2.7	1.4	4.7	0	7.7

Figure 1. Surgical site infection (SSI) rates by specialty and procedure (continued)

Specialty/procedure (n = number of participating trusts)	Number of SSI	Total number of procedures performed	SSI rate (%)				
			Rate (%)	95% CI Lower	95% CI Upper	Minimum	Maximum
Urology (n= 11)	**98**	**5410**	**1.8**	**1.5**	**2.2**	**0**	**15.1**
Artificial urinary sphincter surgery	0	<10				-	-
Cystoscopy	44	2276	1.9	1.4	2.6	0	11.9
Laser prostatectomy	0	33	0	0	11.2	0	0
Penile prostheses surgery	0	21	0	0	17.6	0	0
Sacral nerve stimulation surgery	0	56	0	0	6.6	0	0
Transurethral resection of bladder tumours	23	1256	1.8	1.2	2.7	0	11.9
Transurethral resection of the prostate	13	894	1.5	0.8	2.5	0	6
Urinary tract stone surgery (litholapaxy)	1	198	0.5	0	2.8	0	4
Urinary tract stone surgery (ureteroscopy)	15	594	2.5	1.4	4.2	0	10
Urinary tract surgery (percutaneous nephrolithotomy)	2	82	2.4	0.3	8.8	0	16.7
Vascular Surgery (n= 9)	**116**	**4695**	**2.5**	**2**	**3**	**0.8**	**5.3**
Procedures for abdominal aortic aneurysm	12	721	1.7	0.9	2.9	0	7.1
Carotid endarterectomy	1	412	0.2	0	1.4	0	2.5
Lower limb angioplasty	3	1960	0.2	0	0.4	0	3.3
Lower limb bypass	39	1133	3.4	2.4	4.7	1.9	5.5
Lower limb surgery for peripheral arterial disease (except lower limb bypass)	61	469	13	9.9	16.7	1.9	42.4

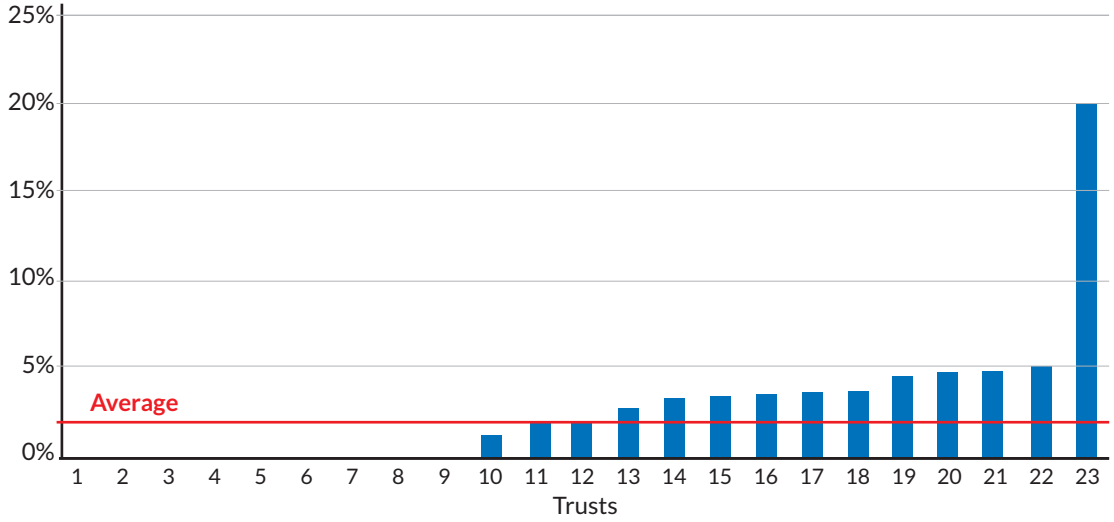
In breast surgery procedures requiring a flap, a mean deep or organ/space SSI rate of 8.9% was calculated from the values reported by the 20 trusts that participated in the survey for this procedure. A SSI rate of 74.4% was reported by the unit with the highest SSI rate. Fifteen units did not report a single infection following breast surgical procedures requiring a flap repair. This illustrates the extreme variability that exisits in recognising and reporting of SSI.

Figure 2. Deep or organ/space SSI rates following breast surgery requiring a flap repair



In general surgery, one trust reported an SSI rate following elective incisional hernia repair of 20%, ten times more than the mean rate reported by all general surgical units participating in the survey.

Figure 3. Deep or organ/space SSI rates following elective incisional hernia repair



Trusts delivering lower volumes of the procedures selected for this survey reported higher SSI rates. This trend was noted in most procedures. The issue of low activity volumes is one which we hope to test more fully in the second survey this year. A greater participation rate may provide statistically meaningful evidence to test whether there is a strong correlation between lower volumes and higher infection rate.

The second survey will also be supported by additional guidance and a change in process, including appointment of SSI survey leads at each trust, to increase consistency of reporting. This should reduce the risk that any relationship between procedure volumes and SSI rates is caused by variation in reporting practices.

Surgical Site Infection: costs to patients

SSIs led to re-operations in a mean of 36.2% of cases, with the rate of re-operation highest in spinal and orthopaedic surgery where mean rates of 84.6% and 82.6% were reported respectively. Furthermore, the mean implant removal rate was 10.5% following spinal surgery infections, and 32.2% following orthopaedic surgery infections.

SSI led to sepsis in 12.0% to 47.2% of cases in the survey, with rates varying across specialties. The rate of sepsis was highest in urology, with a mean reported rate of 47.2% of SSIs. This was followed by cardiothoracic surgery and general surgery, with mean rates of sepsis reported at 41.4% and 37.8% respectively.

A mean all-cause mortality rate associated with SSI of 11.3% was reported following vascular surgery. Mean mortality rates associated with SSI of between 2.9% and 7.6% were reported following general surgery, urology, cardiothoracic and cranial neurosurgery.

These results are an indication that adverse patient outcomes are associated with SSIs, which we suggest necessitates urgent actions by surgical units. Surgical units should adopt a multidisciplinary approach in reporting, monitoring and actively managing their SSI rates to minimise occurrence. While we expect improved quality data in future years, these initial data support our suggestion that it is unacceptable for a surgical unit or trust to be unaware of its infection rates, potentially missing opportunities to improve patient outcomes.

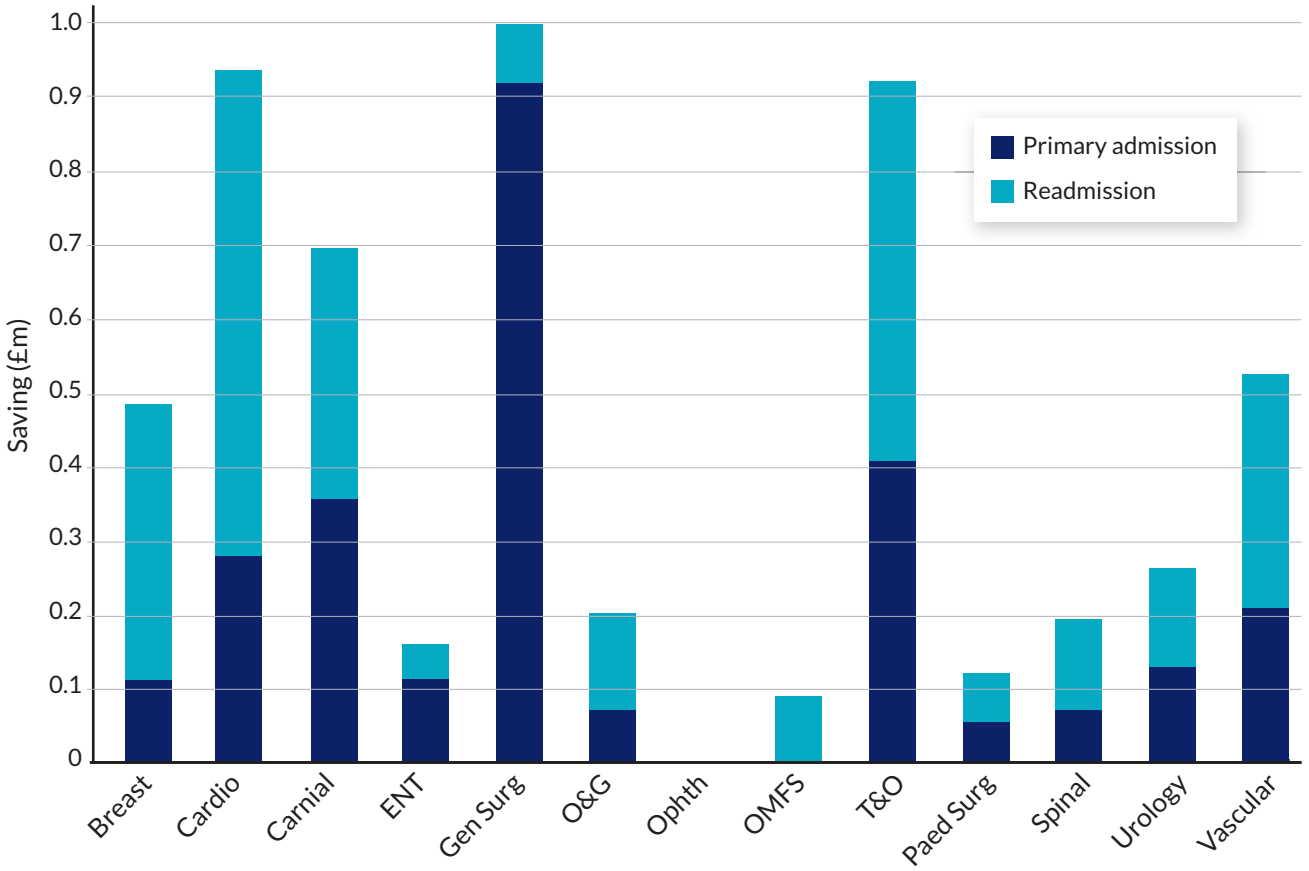
Surgical Site Infection: cost to trusts

Between April 2012 and March 2017, data from NHS Resolution identified 383 medical negligence claims related to SSI in England, with an estimated cost to trusts of £35.2 million.

Junior doctors responding to the survey reported that SSIs led to delays in patient discharge in 34.1% of all cases. The mean length of stay for primary admissions for patients with an SSI was 12.1 days. In almost half of admissions where an SSI was reported, the primary admission was followed by a readmission, with a mean length of stay for this readmission of 9.8 days. Combined, the mean length of stay for patients with an SSI who were subsequently readmitted was 21.9 days.

Delays in discharge and readmissions are poor outcomes for patients and have financial implications to the health economy. For example, in cranial neurosurgery, each SSI case is estimated to cost an extra £3,502 per primary admission as a result of delays to discharge and £6,849 per subsequent admission when patients were readmitted. SSI in vascular surgery cost an extra £1,793 per primary admission for delays to discharge and £5,065 per subsequent admission for readmission. While subsequent SSI audits will provide better estimates, Figure 4 illustrates the notional financial opportunity using the current data that could be achieved if all SSIs were avoided.[2]

Figure 4a. Estimated saving opportunities for participating trusts, based on avoiding delaying discharge and readmission



[2] *These costs relate to the potentially avoidable occupied bed days incurred due to the readmission or delayed discharge. The cost was calculated on a specialty by specialty basis, using an average cost per occupied bed day per specialty applied to the potentially avoidable bed days.*

Figure 4b. Estimated saving opportunities for participating trusts, based on avoiding delaying discharge and readmission

Specialty	Number of units	Primary Admission LoS reduction	Notional financial opportunity per admission	Readmission avoidance	Notional financial opportunity per readmission
Breast Surgery	38	£113,972	£619	£372,096	£3,648
Cardiothoracic Surgery	8	£281,260	£2,580	£653,913	£9,477
Cranial Neurosurgery	6	£360,694	£3,502	£335,601	£6,849
Ear, Nose & Throat	14	£117,674	£3,566	£43,095	£2,873
General Surgery	24	£923,895	£2,109	£705,705	£3,619
Obstetrics & Gynaecology	20	£76,834	£1,011	£126,412	£2,873
Oral & Maxillofacial Surgery	7	£3,288	£33	£90,064	£3,464
Orthopaedic Surgery	29	£408,852	£2,900	£513,989	£5,089
Paediatric Surgery	7	£57,907	£2,145	£65,142	£3,619
Spinal Surgery	7	£70,620	£2,825	£124,758	£6,931
Urology	11	£127,707	£1,216	£135,216	£2,817
Vascular Surgery	9	£208,039	£1,793	£319,095	£5,065
Total Savings	**180**	**£2,750,742**		**£3,485,086**	

Recommendation

Recommendation	Actions	Timeline
1. Trusts to prospectively monitor own surgical units' deep incisional and organ/space SSI rates.	**1A:** GIRFT to organise a second national survey to collect data on SSI rates for selected surgical procedures.	Second survey to be launched in May 2019.
	1B: Trusts to participate in both PHE Surveillance (mandatory and non-mandatory categories) and prospective second GIRFT SSI Survey, ensuring reliable and timely data submission in both surveys.	
	1C: For future surveys, GIRFT and PHE to consider options to reduce duplication, improve participation and methodology.	
	1D: GIRFT to collect and share good practice to reduce SSI via deep dives, GIRFT Hubs and the SSI workstream.	
2. National SSI data to be shared with trusts to help surgical units benchmark their own performance.	**2A:** Results from the GIRFT survey made available to participating trusts.	Upon completion of 1A and 1B.

Preventing Surgical Site Infections

The National Institute for Health and Care Excellence (NICE) has published guidelines on the prevention and treatment of SSIs, considering evidence-based recommendations for pre-, peri- and post-operative interventions to minimise the risk of post-operative infection. Specialty associations also share best practice guidelines to which clinicians may refer to help reduce the risk of post-operative infection. For example, the Association of Breast Surgery and British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) published their guidelines for oncoplastic breast reconstruction in 2012. This lists a selection of measures to reduce SSI. In 2008, the Association of Surgeons of Great Britain and Ireland published their consensus statement on health-associated infections. This statement recognises that reducing SSIs requires multidisciplinary effort, with active input from at least surgeons, microbiologists, infection control teams, nurses, and pharmacists.

Use of local guidelines

In the GIRFT survey, covering the period November 2016 to October 2017, 82.7% of surgical units confirmed the existence of local antibiotic prophylaxis guidelines, and 50.3% of surgical units reported that an SSI prevention bundle was in place. These figures may partly reflect awareness of local policy amongst survey responders, and so we would expect these figures to change when reporting to the second GIRFT SSI audit. Where available, assessment of compliance against antibiotic prophylaxis guidelines were performed in only 34.0% of units. Audits of the use of SSI prevention bundle were performed in 40.2% of the units where a bundle was in place. That some trusts do not have a local antibiotic prophylaxis guideline in place may reflect an underlying lack of awareness among participants of this audit of current local practice for SSI prevention.

Antibiotic prophylaxis

The GIRFT survey indicated variability amongst specialties and units in the use of antibiotic prophylaxis. A systematic review encompassing many surgical specialities has shown preoperative antibiotic prophylaxis were cost-effective.(2) There is a need for specialty-specific (and possibly procedure-specific) guidelines on the use of antibiotic prophylaxis that are supported by best available evidence and expert consensus. Where these guideline already exist and once new evidence is published, we recommend these guidelines should be introduced across all surgical units.

Figure 5. The use of antibiotic prophylaxis reported by all participating units in general surgery, by procedure[3]

Administered within 1hr prior to surgery	Count	Rate	Max	Min
Elective Cholecystectomy	19	38%	0%	100%
Elective gastro Resection	138	88%	0%	100%
Elective Hernia Repair Incisional	12	60%	0%	100%
Elective Hernia Repair Inguinal	5	38%	0%	33%
Emergency Appendicectomy	40	70%	0%	100%
Emergency Cholecystectomy	10	59%	0%	100%
Emergency Laparotomy	87	71%	0%	100%

Administered at anytime before or during surgery	Count	Rate	Max	Min
Elective Cholecystectomy	28	56%	83	100%
Elective gastro Resection	153	97%	100%	100%
Elective Hernia Repair Incisional	18	90%	0%	100%
Elective Hernia Repair Inguinal	7	54%	0%	33%
Emergency Appendicectomy	56	98%	83%	100%
Emergency Cholecystectomy	13	76%	0%	100%
Emergency Laparotomy	112	91%	54%	100%

[3] *NB: The values for "Administered at anytime before or during surgery" are a combined value calculated from the responses to the 3 questions regarding the time of prophylaxis administration in the survey (pre-operatively, within 1 hour prior to 1st incision, during surgery)*

Laminar flow theatres

The 2015 GIRFT Orthopaedics report[4] recommended use of Laminar Flow Theatres, which are now used for 95% of orthopaedic elective surgery according to the GIRFT survey. There is mixed evidence on the impact of laminar flow on SSI rates, which can explain absence from NICE and WHO guidance. GIRFT's view is that laminar flow theatres could be considered for implant and other major surgeries (e.g. abdominal and vascular surgery). Laminar airflow theatres ensure ultra-clean ventilation, reducing airborne contamination, and can signal a trust's commitment to infection prevention. Of course, trusts should always consider costs of laminar flow against potential benefit when making investment decisions.

Figure 6. The use of laminar flow theatre by participating trusts, by specialty.

	Trusts with laminar flow	% trusts with laminar flow contributing to the survey
Breast Surgery	15	56%
Cardiothoracic Surgery	5	63%
Cranial Neurosurgery	0	0%
Ear Nose and Throat	3	30%
General Surgery	12	52%
Obstetrics and Gynaecology	7	50%
Ophthalmology	0	0%
Oral and Maxillofacial Surgery	5	71%
Orthopaedic Surgery	27	93%
Paediatric Surgery	0	0%
Spinal Surgery	3	60%
Urology	2	22%
Vascular Surgery	3	33%

Post-operative follow-up

Post-operative follow-up arrangements vary across specialties and units. Good post-operative care supports prevention and early detection of complications. This is especially important for SSI, where early diagnosis of superficial infection can potentially prevent severe infection that may require re-hospitalisation and re-operation.

Surgical units should work closely with community colleagues to support the delivery of post-operative wound care and to aid patients' post-operative recovery. Units should also provide patients with information of wound care, including information about the signs and symptoms of infection. We would suggest that units advise patients about the benefit of contributing to PHE's Post Discharge Questionnaire.

Follow-up values reported to the GIRFT SSI survey were surprisingly variable, something which we would hope to investigate more in the second survey.

Figure 7. Arrangement of follow-up appointment

Follow-up appointment arranged	Yes	No
Breast Surgery	100%	0%
Cardiothoracic Surgery	99%	1%
Cranial Surgery	67%	33%
ENT	100%	0%
General Surgery	65%	35%
Obstetrics & Gynaecology	71%	29%
Oral Surgery	66%	34%
Orthopaedic Surgery	99%	1%
Paediatric Appendicectomy	63%	37%
Spinal Surgery	100%	0%
Urology	79%	21%
Vascular Surgery	91%	9%

[4] *Briggs (2015) A national review of adult elective orthopaedic services in England GETTING IT RIGHT FIRST TIME, available via: https://gettingitrightfirsttime.co.uk/wp-content/uploads/2017/06/GIRFT-National-Report-Mar15-Web.pdf*

Recommendation

Recommendation	Actions	Timeline
3. Trusts to reduce SSI rates to improve patient care and reduce related costs.	**3A:** GIRFT clinical leads and regional hub teams to support trusts in reviewing data and recommending changes.	For continual action by trusts throughout the GIRFT.
	3B: Trusts to review own surgical units' deep SSI rates and introduce positive changes, through a multi -disciplinary approach, to reduce infection risk pre-, peri- and post-operatively.	
	3C: Trusts to ensure appropriate post-operative follow up appointments are made at point of discharge.	

Case Study: Multidisciplinary approach to reducing SSI rates in hip fracture patients

Acknowledgements: Christopher Gee, Richard George, Rishi Chana, Hazel Watters, Keefai Yeong.

Background

Ashford and St Peter's Hospitals NHS Foundation Trust treats approximately 400 hip fracture patients per year. While participating in Public Health England's SSI surveillance programme, the trust received high outlier hospital notifications from PHE based on comparison of their SSI rate to the national benchmark. Local audit data suggested a 5% infection rate.

Intervention(s)

A multidisciplinary approach was taken. The whole patient journey was examined. Evidence based modifiable risk factors for infection were identified through a review of literature and national guidelines. Multiple simultaneous changes to patient care were made with the aim of achieving an aggregation of marginal gains and lower infection rates. Interventions were:

Pre-operative

- Nutrition drinks for all patients
- Pre-operative chlorhexidine wash
- Pre-operative warming

Intra-operative

- Change of air filters in theatre
- Tighter patient temperature control in theatre
- The use of Iodine impregnated incise drapes
- Pre-operative tranexamic acid 1g IV for all patients
- Cemented implants as standard
- Glycaemic control

Post-operative

- A restrictive transfusion protocol with single unit transfusions
- An oozing wound protocol

Results

Between September 2017-18, 422 patients were treated surgically for hip fracture. Outcomes for this patient cohort compared with a patient cohort before changes to patient care were implemented illustrated that:

- Peri-operative hypothermia rates dropped from 44% to 3%.
- Transfusion rates dropped from 28% to 18% and the mean number of units transfused in these patients dropped from 1.8 to 1.1 units. Tranexamic acid usage improved from 35% to 75%.
- Cemented implant usage increased to 83.2%.
- Mortality rates dropped to 4%.
- Mean length of stay dropped from 15.7 to 13.8 days.

Early infection rates dropped to 0.24%. Up to 20 infections were potentially prevented. GIRFT estimates the cost of one deep SSI to be £100,000.[5] This project therefore potentially saved up to £2 million as well as improving patient care and outcomes.

Discussion

The results achieved above were only possible because of engagement from the whole of the wider MDT involved in the patient journey. An MDT approach using the theory of the aggregation of marginal gains can have a significant impact on patient care.

[5] *These costs include re-operation, extended length of stay, high-cost long term antibiotics and new high cost replacement protheseses as described in the 2015 GIRFT Orthpaedics report, Briggs (2015) A national review of adult elective orthopaedic services in England , Getting it Right First Time.*

List of participating trusts and surgical units

Showing participating trust and the specialties included within their local audit.

Aintree University Hospital NHS Foundation Trust Orthopaedic Surgery
Alder Hey Children's NHS Foundation Trust Paediatric Appendectomy
Ashford and St Peter's Hospitals NHS Foundation Trust Vascular Surgery
Barking, Havering and Redbridge University Hospitals NHS Trust Cranial Surgery
Barts Health NHS Trust Breast Surgery
Bedford Hospital NHS Trust Obstetrics & Gynaecology
Blackpool Teaching Hospitals NHS Foundation Trust Cardiothoracic Surgery ENT General Surgery Obstetrics & Gynaecology Ophthalmology Orthopaedic Surgery Paediatric Appendectomy Urology
Bolton NHS Foundation Trust Breast Surgery Ophthalmology Orthopaedic Surgery

Bradford Teaching Hospitals NHS Foundation Trust Breast Surgery
Brighton and Sussex University Hospitals NHS Trust Breast Surgery Vascular Surgery
Buckinghamshire Healthcare NHS Trust Ophthalmology Oral Surgery
Burton Hospitals NHS Foundation Trust Breast Surgery
Calderdale and Huddersfield NHS Foundation Trust ENT Orthopaedic Surgery
Cambridge University Hospitals NHS Foundation Trust Obstetrics & Gynaecology
Chelsea & Westminster NHS Foundation Trust Breast Surgery
Chesterfield Royal Hospital NHS Foundation Trust Orthopaedic Surgery
City Hospitals Sunderland NHS Foundation Trust ENT Obstetrics & Gynaecology Ophthalmology Orthopaedic Surgery Paediatric Appendectomy Spinal Surgery

Participating trusts and surgical units (continued)

Colchester Hospital University NHS Foundation Trust
Paediatric Appendectomy

Croydon Health Services NHS Trust
Breast Surgery

Dartford and Gravesham NHS Trust
Breast Surgery
Orthopaedic Surgery

Derby Hospitals NHS Foundation Trust
Breast Surgery
Obstetrics & Gynaecology

Doncaster and Bassetlaw Hospitals NHS Foundation Trust
Breast Surgery
Urology

East and North Hertfordshire NHS Trust
ENT
Obstetrics & Gynaecology
Ophthalmology
Orthopaedic Surgery

East Kent Hospitals University NHS Foundation Trust
Breast Surgery
General Surgery
Orthopaedic Surgery
Spinal Surgery

East Lancashire Hospitals NHS Trust
Breast Surgery
ENT
General Surgery
Obstetrics & Gynaecology
Ophthalmology
Oral Surgery
Orthopaedic Surgery
Paediatric Appendectomy
Urology
Vascular Surgery

East Sussex Healthcare NHS Trust
Breast Surgery
Orthopaedic Surgery

Epsom and St Helier University Hospitals NHS Trust
Ophthalmology
Orthopaedic Surgery

Frimley Health NHS Foundation Trust
General Surgery
Obstetrics & Gynaecology
Orthopaedic Surgery

Great Western Hospitals NHS Foundation Trust
Oral Surgery

Guy's and St Thomas's NHS Foundation Trust
Oral Surgery

Heart of England NHS Foundation Trust
Cardiothoracic Surgery

Participating trusts and surgical units (continued)

Homerton University Hospital NHS Foundation Trust
Orthopaedic Surgery

Hull and East Yorkshire Hospitals NHS Trust
Cranial Surgery

Imperial College Healthcare NHS Trust
Breast Surgery
ENT
General Surgery
Obstetrics & Gynaecology
Ophthalmology
Vascular Surgery

Ipswich Hospital NHS Trust
General Surgery

Isle of Wight NHS Trust
ENT
General Surgery
Obstetrics & Gynaecology
Ophthalmology
Orthopaedic Surgery
Urology

James Paget University Hospitals NHS Foundation Trust
Ophthalmology
Orthopaedic Surgery

Kingston Hospital NHS Foundation Trust
Obstetrics & Gynaecology
Ophthalmology
Urology

Lancashire Teaching Hospitals NHS Foundation Trust
General Surgery

Leeds Teaching Hospitals NHS Trust
Breast Surgery
Cardiothoracic Surgery
Cranial Neurosurgery
ENT
Obstetrics & Gynaecology
Ophthalmology
Orthopaedic Surgery
Spinal Surgery
Urology

Liverpool Heart and Chest Hospital NHS Foundation Trust
Cardiothoracic Surgery

London North West Healthcare NHS Trust
Breast Surgery
ENT
General Surgery
Ophthalmology
Oral Surgery
Orthopaedic Surgery
Urology

Maidstone and Tunbridge Wells NHS Trust
Breast Surgery
General Surgery

Mid Cheshire Hospitals NHS Foundation Trust
Obstetrics & Gynaecology

Milton Keynes Hospital NHS Foundation Trust
General Surgery

Moorfields Eye Hospital NHS Foundation Trust
Ophthalmology

Participating trusts and surgical units (continued)

Norfolk and Norwich University Hospitals NHS Foundation Trust
Spinal Surgery
Vascular Surgery

North Bristol NHS Trust
Cranial Surgery
Obstetrics & Gynaecology
Orthopaedic Surgery
Spinal Surgery

North Middlesex University Hospital NHS Trust
General Surgery
Paediatric Appendectomy

Northern Lincolnshire and Goole Hospitals NHS Foundation Trust
Breast Surgery

Northumbria Healthcare NHS Foundation Trust
Breast Surgery
Obstetrics & Gynaecology

Nottingham University Hospitals NHS Trust
ENT
General Surgery
Orthopaedic Surgery
Vascular Surgery

Oxford University Hospitals NHS Foundation Trust
Ophthalmology

Papworth Hospital NHS Foundation Trust
Cardiothoracic Surgery

Pennine Acute Hospitals NHS Trust
Breast Surgery

Peterborough and Stamford Hospitals NHS Foundation Trust
Urology

University Hospitals Plymouth NHS Trust
Cardiothoracic Surgery
Orthopaedic Surgery

Poole Hospital NHS Foundation Trust
Oral Surgery

Portsmouth Hospitals NHS Trust
Breast Surgery

Royal Berkshire NHS Foundation Trust
Breast Surgery
General Surgery

Royal Brompton and Harefield NHS Foundation Trust
Cardiothoracic Surgery

Royal Free London NHS Foundation Trust
Breast Surgery

Royal Liverpool and Broadgreen University Hospitals NHS Trust
Breast Surgery
ENT

Royal National Orthopaedic Hospital NHS Trust
Orthopaedic Surgery
Spinal Surgery

Royal Surrey County NHS Foundation Trust
Breast Surgery
Ophthalmology

Sandwell and West Birmingham Hospitals NHS Trust
Breast Surgery

Sheffield Teaching Hospitals NHS Foundation Trust
Ophthalmology

Participating trusts and surgical units (continued)

Sherwood Forest Hospitals NHS Foundation Trust
Orthopaedic Surgery

South Tyneside NHS Foundation Trust General Surgery
Orthopaedic Surgery

Southport and Ormskirk Hospital NHS Trust
General Surgery
Obstetrics & Gynaecology
Orthopaedic Surgery

St George's Healthcare NHS Trust
Breast Surgery
Cardiothoracic Surgery
ENT
Orthopaedic Surgery
Vascular Surgery

Stockport NHS Foundation Trust
Urology

Tameside Hospital NHS Foundation Trust
ENT
Obstetrics & Gynaecology
Orthopaedic Surgery

Taunton and Somerset NHS Foundation Trust
Breast Surgery
General Surgery
Urology

The Christie NHS Foundation Trust
General Surgery
Obstetrics & Gynaecology
Urology

The Dudley Group NHS Foundation Trust
Obstetrics & Gynaecology
Orthopaedic Surgery
Vascular Surgery

The Hillingdon Hospitals NHS Foundation Trust
General Surgery

The Princess Alexandra Hospital NHS Trust
Breast Surgery

The Robert Jones & Agnes Hunt Orthopaedic Hospital NHS Foundation Trust
Spinal Surgery

The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
Ophthalmology

The Royal Marsden NHS Foundation Trust
Breast Surgery
Obstetrics & Gynaecology

The Royal Orthopaedic Hospital NHS Foundation Trust
Orthopaedic Surgery

The Royal Wolverhampton NHS Trust
Breast Surgery
Cardiothoracic Surgery
General Surgery

The Walton Centre NHS Foundation Trust
Cranial Surgery
Spinal Surgery

Torbay & South Devon NHS Foundation Trust
Breast Surgery

United Lincolnshire Hospitals NHS Trust
Breast Surgery
General Surgery

Participating trusts and surgical units (continued)

Lewisham and Greenwich NHS Trust ENT General Surgery
University Hospitals of North Midlands NHS Trust Breast Surgery Cranial Surgery General Surgery
University Hospital of South Manchester NHS Foundation Trust Breast Surgery
University Hospital Southampton NHS Foundation Trust Ophthalmology Oral Surgery Paediatric Appendectomy
University Hospitals of Leicester NHS Trust Breast Surgery ENT
West Suffolk NHS Foundation Trust General Surgery Orthopaedic Surgery
Wirral University Teaching Hospital NHS Foundation Trust Breast Surgery
Wrightington, Wigan and Leigh NHS Foundation Trust Obstetrics & Gynaecology
York Teaching Hospital NHS Foundation Trust Vascular Surgery

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GETTING IT RIGHT FIRST TIME

GIRFT is delivered in partnership with the
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