

NOCA QUALITY IMPROVEMENT CHAMPION AWARD 2021



The NOCA 'Quality Improvement Champion Award' recognises an individual or team who has made best use of national or local clinical audit data to improve patient care in their hospital/hospital group/healthcare organisation.

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NOCA QUALITY IMPROVEMENT CHAMPION AWARD - 2021 SUBMISSIONS

Alphabetical order by title.

	Submission Title	Organisation	Project Team	Lead/s
1.	Accelerated Community Discharge Careplan	University Hospital Limerick	Orthogeriatric & Orthopaedic team; Trauma Ward	Nur Atikah Mhd Asri, Pamela Hickey, Stephen White
2.	Audit of facial pressure injuries in COVID-19 staff	Beaumont Hospital/ RCSI	Natalie McEvoy, Prof Zena Moore, Prof Declan Patton, Prof Ger Curley, Dr Pinar Avsar, Prof Tom O'Connor, Dr Agelica Budri, Dr Linda Nugent, Simone Walsh, Linda McEvoy, Sinead Connolly, Dr Jennifer Clarke	Natalie McEvoy
3.	Development of a Virtual OA Knee Clinic In SVUH	St Vincent's University Hospital	Vanessa Cuddy, Aoife Caffrey, Paul Curtin	Vanessa Cuddy, Aoife Caffrey
4.	Diagnosing the presence of Atrial Fibrillation and other cardiac abnormalities in patients who present with Acute Stroke and TIA in Connolly Hospital using 72 hour Holter Monitors	Connolly Hospital	Lisa Donaghy Dr Eamon Dolan Dr Marie O'Connor Dr. Avril Beirne, Dr. Patricia Guilfoyle and the Cardiac Diagnostics Department	Lisa Donaghy
5.	Enhancing Patient Visibility and Safety on a COVID Ward	St James's Hospital	Covid-19 ward nursing staff	Bernie Waterhouse, Anthony Galvin, Christopher Soraghan
6.	Fast track pathway for degenerative cervical myelopathy	Beaumont Hospital	Department of Neurosurgery and Physiotherapy	Caroline Treanor, Warren Lenehan
7.	Getting the balance right for families: managing low blood sugars in newborn infants in a maternity setting	The National Maternity Hospital	Dr Anna Curley, Dr Ibrahim Dafalla, Dr Sarah Kasha, Avril Kearney, Hilda Wall	Dr Anna Curley
8.	Improving IHFD Hip Fracture Standard 1 - patient's admission times to bed	Mater Misericordiae University Hospital	MMUH Hip Fracture Governance Committee	Mary Mullen, Dr Sandra O' Malley, Keith Synnott, Dr Vinny Raminah, Prof Joe Duggan, Dr Liz Callaly, Ruth Buckley, Karen Fitzpatrick

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9.	Introduction of Beta D-Glucan Testing	Mater Misericordiae University Hospital	Dr Breda Lynch, Dominic Gilmore, Fiona Hegarty, Nuala Scanlon, Leah Colclough, Louise O'Sullivan, Assumpta Killarney	Dr Breda Lynch
10.	ISBAR3	Children's Health Ireland Crumlin	Warren O'Brien	Warren O'Brien
11.	Medication Request and Administration Record for Public Health Nursing	Public Health Nursing Service, Community Healthcare Organisations, HSE	Virginia Pye, Ina Crowley, Sinead Lawlor, Breda Horgan, Olivia Byrne, Margaret Nally, Marie Therese Buckley, Fiona O'Connor Power, Dr David Hanlon, Muriel Pate, Eileen Whelan, Clare MacGahann, Lisa Marry	Virginia Pye
12.	Prostate Biopsy Infection Rates in the Mater Hospital Radiology Department	Mater Misericordiae University Hospital	Dr Jack Power, Dr Carmel Cronin, Dr Barry Hutchinson, Dr Daragh Murphy, Kiaran O'Malley, Dr Margaret Hannan Catherine McGarvey, Nisha Soman, Prof John Murray	Dr Jack Power, Dr Carmel Cronin, Prof John Murray
13.	Reducing Hospital Acquired Pressure Ulcers using Plan, Do, Study, Act (PDSA) Quality Cycle	Incorporated Orthopaedic Hospital, Clontarf	Emma Cullen Gill	Emma Cullen Gill
14.	Striking back against stroke	Connolly Hospital	Lisa Donaghy, Laura Morrison, Julie Prendergast, Dr Eamon Dolan Dr Marie O'Connor Dr Avril Beirne, Dr Patricia Guilfoyle	Lisa Donaghy

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	Submission Title	Organisation	Project Team	Lead/s
15.	UHW OA Knee Pathway	University Hospital Waterford, UHW Orthopaedic Dept, South East Community Healthcare Physiotherapy, South East Community Healthcare Dietetics.	Siobhan Corcoran, Professor May Cleary, Terence Murphy, Damian Rice, Pauline Kirwan, Anne-Marie Tully	Siobhan Corcoran
16.	Utilization of Lean Six Sigma Tools for Quality Improvement in Interventional Radiology	Mater Misericordiae University Hospital	James W Ryan, Sine Gilchrist, Leo P Lawler, Sean Paul Teeling, Anita Little, Mark Glynn, Lisa Comerford, Megan Power-Foley, Tony Geoghegan, John G Murray	James W Ryan, Sine Gilchrist, Leo P Lawler

WINNER

Accelerated Community Discharge Careplan

University Hospital Limerick

Project Team: Orthogeriatric &
Orthopaedic team; Trauma Ward

Project Lead's: Nur Atikah Mhd Asri,
Pamela Hickey, Stephen White



HIGHLY COMMENDED

Improving Hip Fracture Patient's Admission Times To Bed. Standard 1 of the IHFD

Mater Misericordiae University Hospital

Project Team: MMUH Hip Fracture Governance Committee

Project Lead's: Mary Mullen, Dr Sandra O' Malley, Keith Synnott, Dr Vinny Raminah, Prof Joe Duggan, Dr Liz Callaly, Ruth Buckley, Karen Fitzpatrick



HIGHLY COMMENDED

Getting the balance right for families: managing low blood sugars in newborn infants in a maternity setting

The National Maternity Hospital

Project Team: Dr Anna Curley, Dr Ibrahim Dafalla, Dr Sarah Kasha, Avril Kearney, Hilda Wall

Project Lead: Dr Anna Curley



ENTRY 1 - WINNER

QI PROJECT TITLE	Accelerated Community Discharge Careplan (ACDC)
PROJECT LEAD(S)	Nur Atikah Mohd Asri, Pamela Hickey, Stephen White
PROJECT TEAM	Orthogeriatric & Orthopaedic team; Trauma Ward
ORGANISATION(S)	University Hospital Limerick
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND & AIMS

Hip fractures are associated with high one-year mortality rates and poor functional outcomes. Rehabilitation is often required; however, high demand for rehab services often caused significant discharge delays in our institution. Guided by the Sláintecare vision of integrated care model, the Accelerated Community Discharge Care-plan (ACDC) was established in our institution in December 2019 aiming to facilitate early and safe transition of orthogeriatric patients' direct discharge home with continuous multi-disciplinary team (MDT) input to support early community-based rehabilitation. Secondary outcome include decreasing inpatient length of stay (LOS), reducing demand for inpatient rehabilitation, and compliance to the Irish Hip Fracture Standards (IHFS).

METHOD

A retrospective cohort study was performed with data collected from the Irish Hip Fracture Database between January to June 2019 (n=76), and compared with similar cohort in 2020 (n=65). Further sub-analysis was performed by stratifying the data into 3 groups, with group 1 (n=32) 'enrolled to ACDC', group 2 (n=76) '2019 cohort who met ACDC criteria' and group 3 (n=33) 'met ACDC criteria but lived outside catchment area'. Patient admitted between March 23rd to May 11th were excluded to minimise the impact of COVID-19 as a confounding factor. ACDC inclusion criteria include 1) address within 20-miles, 2) independent pre-morbid baseline or sufficient community support, 3) no significant cognitive impairment, 4) no substance abuse, 5) motivated to engage in ACDC programme, 6) medically fit for discharge and 7) potential to achieve agreed goals within two weeks. Outcome measures observed were 1) LOS, 2) compliance to IHFS, 3) 30-day readmission, and 4) 30-day mortality rate. Statistical analysis was performed using SPSS.

FINDINGS/RESULTS

Demographic information was comparable to the national figures. 50.7% of the 2020 cohort fit the ACDC criteria but live outside the catchment area. 78.1% of the 2020 cohort were discharged directly home compared to 24.2% in 2019 (P = 0.001). Mean LOS was significantly shorter (P=0.001) in 2020 (21.84 ± 8.3 days) compared to 2019

(37.24 ± 6.7 days). Significant improvements were observed ($P = 0.001$) in four out of the six IHFS. 30-day readmissions and 30-day mortality rates were comparable. Analysis of the 3 groups revealed a significant reduction in LOS in group 1 (9.3 ± 6.9 days) compared to group 2 (11.39 ± 12.2 days) and group 3 (12.45 ± 11.1) as well as a higher rate of direct discharge home in group 1 (78.1%) compared to group 2 (25%) and group 3 (24.2%). Compared to standard care, ACDC allowed average saving of 2 acute inpatient bed-day, 6 rehab bed-day and 3 weeks transitional funding bed-day with average total savings of € 5,526 per patient enrolled into the programme, which up to June 2020 totaled to €176,832. Projected potential savings had all the patients who met the criteria included within the 6 months period is €359,190, with the annual projection for 2020 being €713,380.

QUALITY IMPROVEMENT PLAN

Following the 'hip fracture quality improvement collaborative', arranged by NOCA and the HSE Quality Improvement Team in December 2019, a trio of orthopaedic CNM, orthogeriatric registrar and Physiotherapist (PT) came up with the idea for ACDC. In the beginning, the community MDT was engaged in the process, and the activity-based funding was utilised to hire additional occupational therapist (OT) and PT during the trial period. As a pilot program, community MDT supports were only available for patients living within 20-miles radius of Limerick city. Aiming to assist with patients' education and provide reference material for their continuing treatment and daily exercises at home, a 'hip fracture booklet' (HFB) was created and supplied to all patients in the ACDC programme.

Clear patient selection criteria were established to ensure only suitable candidates were selected to prevent potential risky or failed discharges. Clear communication lines were established between acute and community services with a back-up plan for urgent review in the orthopaedic clinic made available for any patients with difficulties.

STAKEHOLDER ENGAGEMENT

ACDC's success was attributed to the positive enthusiasm shown by all the stakeholders involved. The project's multi-disciplinary nature makes every stakeholder feel a sense of ownership towards the program's success. However, this project's biggest success factor was the patients' buy-in and confidence in the programme. This was strengthened via the HFB, and easy access to safety net if required.

Patients' ACDC journey starts the moment they arrived in the hospital. They would receive full medical, PT and OT input pre and post-operatively to optimise care. Dedication of PT and OT ensure that post-operative patients are ready as soon as possible through intensive, twice a day, twenty minutes PT and OT sessions daily. Patient and family members were heavily involved in education and daily exercise with treatment plan clearly documented in the HFB. This booklet is utilised by all MDT members from acute to community care and provides a continuation and reference point for patients.

Community MDT is instrumental for without their buy-in and dedication, ACDC would not have successfully lift off the ground. The effective communication and frequent

weekly meetings helped to iron out issues identified in the project early on. Through ACDC, the patient is provided daily access to HCA, with two PT and OT sessions per week at home. Any issues encountered in the community are communicated to acute services and addressed immediately. This improved confidence in the programme and minimised complications to the patient.

SUSTAINING THE IMPROVEMENT

Clear communication lines and the availability of a fail-safe referral pathways were integral to ACDC's success. The HFB provided a central reference point for all stakeholders. It is used as an education tool by MDT in acute services, a reference tool and diary for the patient, follow-up tool by community MDT and as a reference point and visual aid during patient's follow-up in the virtual orthopaedic clinic. Because of the pilot program's success, ACDC is now extended beyond the 20-miles limit, with new hubs to be rolled out in county Clare and county Tipperary by the end of January 2021.

ENTRY 2

QI PROJECT TITLE	Audit of facial pressure injuries in Covid-19 staff
PROJECT LEAD(S)	Ms Natalie L. McEvoy, PhD Scholar, RCSI University of Medicine and Health Sciences.
PROJECT TEAM	Prof Zena Moore, Prof Declan Patton, Prof Ger Curley, Dr Pinar Avsar, Prof Tom O'Connor, Dr Aglecia Budri, Dr Linda Nugent, Ms Simone Walsh, Ms Linda McEvoy, Ms Sinead Connolly, Dr Jennifer Clarke
ORGANISATION(S)	Beaumont Hospital/ RCSI University of Medicine and Health Sciences.
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

Healthcare staff providing vital frontline care to patients during the current COVID-19 pandemic continuously wear Personal Protective Equipment (PPE), in particular facemasks. Facial Pressure Injuries (FPIs) are a significant problem resulting from wearing protective facemasks, because, without a skin protector the masks can mechanically indent the skin, causing redness, blisters, skin tears and deeper tissue damage.

OBJECTIVE

The objective of this 12-week clinical audit was to implement a newly developed evidence based 5-step FPI care bundle specifically tailored for COVID-19 staff during the current COVID-19 emergency, and evaluate the impact of the bundle, after three consecutive shifts, on the incidence of FPIs, Infection and Comfort.

CHANGE IMPLEMENTED

The 5-step care bundle was the change implemented and was designed in accordance with international guidelines and best practice based on clinical feedback.

AUDIT METHODOLOGY

The care bundle was available to staff on a touch button on their iPhone. The bundle steps are in appendix 1. Three products were used in the care bundle:

- Mepitac tape™
- WaterWipes™, donated by WaterWipes (Drogheda, Ireland) for the duration of the audit
- Eucerin Aquaphor Balm™, donated by Beiersdorf (Hamburg, Germany) for the duration of the audit.

The audit was prospective over 12-weeks. Natalie McEvoy (ICU Clinical Research Nurse/PhD Scholar) collected data on the following for each staff member involved in the audit across three consecutive shifts.

(1). Incidence of FPIs – using visual skin assessment and the European Pressure Ulcer Advisory panel pressure ulcer-grading system.

(2). Pain and discomfort using facemasks – using a Visual Analog Scale for Pain

Evaluated daily by Natalie McEvoy, for three shifts, but quantified as it arose over the evaluation period.

(1). Inability to wear a mask due to tissue damage – self-reported with verification provided by the unit manager.

AUDIT RESULTS

A total of 114 staff provided feedback on the use of the care bundle. Nursing staff accounted for the largest group (68%; n=77), see table 1.

Table 1: The professional discipline of the staff using the care bundle

Discipline	Frequency	Percent
Nurse	77	68.0
Doctor	6	5.0
Physiotherapist	10	9.0
Healthcare assistant	9	8
Other	11	10
Total	114	100.0

Skin injury prior to use of the care bundle

Overall, 29% (n=33) of the staff had a skin injury before using the care bundle, see table 2. An abrasion was the most common 16% (n=18), followed by a skin tear 9% (n=10)

Table 2: Type of skin injury, pre-use of the care bundle

Type of skin injury	Frequency	Percent
Abrasion	18	16.0
Blister	1	1.0
Deep sore	4	4.0
Skin tear	10	9.0
None	81	70.0
Total	114	100.0

Skin injury, while use of the care bundle

Overall, 8% of the staff (n=9) had a skin injury while using the care bundle, see table 3. A skin tear (3.5%; n=4), was the most common. The mean number of days to skin injury development was 2.33 (SD: 0.71; median 2; min 1, max 3).

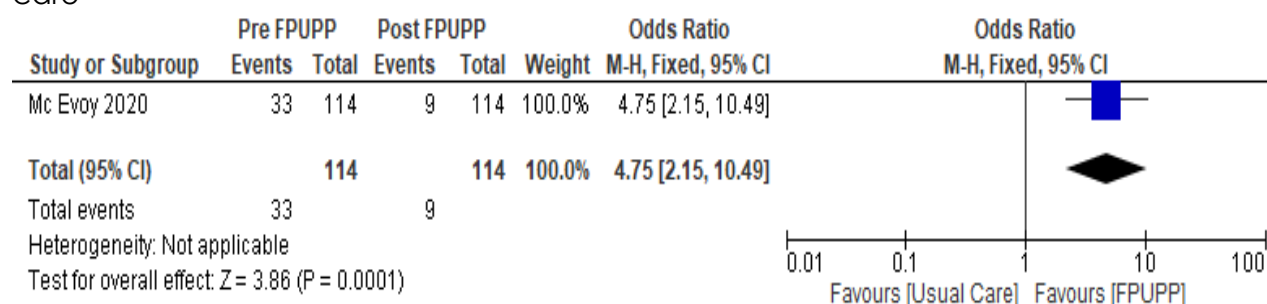
Table 3: Type of skin injury, while using the care bundle

Type of skin injury	Frequency	Percent
Abrasion	2	1.8
Blister	2	1.8
Deep sore	1	0.9
Skin tear	4	3.5
None	105	92.0
Total	114	100.0

Odds ratio of skin injury development, care bundle versus usual care

Figure 2 outlines the forest plot of the odds ratio of skin injury development. In the pre-care bundle group 29% (n=33) of the staff developed a skin injury, whereas in the post care bundle group 8% (n=9) developed a skin injury. The OR of skin injury development is 4.75 (95% CI: 2.15 to 10.49; $p=0.0001$), meaning that with use of the care bundle staff are almost 5 times less likely to develop a skin injury, with the true population parameter lying between 2 times and 10.5 times less likely.

Figure 1: Forest Plot: Odds ratio of skin injury development, care bundle versus usual care



Pain while wearing personal protective equipment with the care bundle

Staff rated their pain on a scale of 0-10 while using PPE with the care bundle. The mean pain score was 3.18/10 (SD: 2.44; median: 3; min 0, max 10), see table 4.

Table 4: Pain while wearing PPE with the care bundle

Pain while wearing PPE with the care bundle (0=no pain, 10=worst pain imaginable)	
Mean	3.18
Median	3.00
Std. Deviation	2.44
Minimum	0
Maximum	10

Pain once the PPE was removed

Staff also rated their pain, on a scale of 0-10, once the PPE was removed. The mean pain score was 1.73/10 (SD: 2.11; median: 1; min 0, max 9), see table 5.

Table 5: Pain once the PPE was removed

Pain once the PPE is removed (0=no pain, 10=worst pain imaginable)	
Mean	1.73
Median	1.00
Std. Deviation	2.11
Minimum	0.0
Maximum	9.0

How easy was the care bundle to use?

Staff rated on a scale of 0-10, how easy they found the care bundle to use. The mean score was 7.76 (SD: 3.06; median: 9; min 0, max 9), see table 6.

Table 6: Ease of use of the care bundle

Ease of use of the care bundle (0=difficult, 10=easy)	
Mean	7.76
Median	9
Std. Deviation	3.06
Minimum	0
Maximum	10

Would you recommend this care bundle to a colleague?

Staff rated on a scale of 0-10, how likely they would recommend the care bundle to a colleague. The mean score was 8.25 (SD: 2.61; median: 10; min 0, max 10), see table 7.

Table 7: Ease of use of the care bundle

Would you recommend this care bundle to a colleague? (0=least likely, 10=very likely)	
Mean	8.25
Median	10
Std. Deviation	2.61
Minimum	0
Maximum	10

SUSTAINING IMPROVEMENT

Protection of frontline healthcare workers during the current COVID-19 pandemic is a clinical priority. Throughout the pandemic, it has become apparent that staff have suffered FPIs from the prolonged use of facemasks, thus the need for this audit emerged. This audit shows that using the care bundle reduced the incidence of skin injury from 29% to 8%, and staff found the bundle easy to use, safe, and effective. This audit shows that when skincare is prioritised, adopting a prevention care bundle approach works. The recommendations made following this audit were added to the departmental quality improvement plan (QIP). In order to ensure there is sustained improvement and continuous adherence with the bundle in practice, we intend to reevaluate/audit the current practice to ascertain if the use of the care bundle has been sustained whilst the COVID-19 pandemic is ongoing. We also intend to nominate staff nurses in the clinical area with an interest in clinical audit and QI initiatives to conduct the re-evaluation/audit.

Appendix 1: Facial Pressure Ulcer Prevention Bundle Poster





FACIAL PRESSURE ULCER PREVENTION BUNDLE

1

SKIN PROTECTION

Clean the skin with WaterWipes™ and apply Eucerin Aquaphor™ to the area behind and around the ears, forehead, nose and malar area one hour before the facemask is applied (before you leave home for your shift).





2

MASK SELECTION

Select the facemask compatible with the level of risk and care being provided.




3

MATERIAL USE

- Cut and adjust the protective material to the application sites.
- Apply the tape gently to the respective facial areas, avoiding wrinkles or folds.
- Apply the facemask over the protective tape.
- Check the tape and facemask sealing.







4

INSPECT REGULARLY

Inspect the skin under the PPE regularly - oedema and redness (blanchable or non-blanchable) are a red flag!

The facemask should be changed if the tape or mask gets wet or damaged.





5

CLEANSING & HYDRATION

At the end of your shift:

- Remove the facemask and tape in line with institution infection prevention and control procedures.
- Clean your hands, face and neck with WaterWipes™ and apply Eucerin Aquaphor™.






THIS RESOURCE IS AVAILABLE ONLINE

RCSI - SWAT - RESEARCH - CENTRE

ENTRY 3

QI PROJECT TITLE	Development of a Virtual OA Knee Clinic
PROJECT LEAD(S)	Vanessa Cuddy & Aoife Caffrey
PROJECT TEAM	Physiotherapy Department: Vanessa Cuddy, Aoife Caffrey & Mr. Paul Curtin (Orthopaedics)
ORGANISATION(S)	St Vincent's University Hospital, Dublin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

- Due to COVID 19 pandemic, the Emergency Department at St. Vincent's University Hospital (SVUH) moved into the Bone and Joint Unit, and the majority of Orthopaedic outpatient clinics were cancelled as there is no clinical space available in which to assess and treat patients.
- We developed a way to provide assessment and facilitate management pathways for patients with OA (osteoarthritic) knee, who would otherwise not be seen during the current restrictions.

AIM

To develop a virtual triage service for patients over 50 years of age who are referred to the orthopaedic Department with OA knee. Our objectives are that:

- All patients will be seen within 4/52 of opt-in to the service.
- Patients will receive a standardised virtual assessment.
- Patients will receive a clear diagnosis at the end of their assessment.
- Patients will be directed into evidenced based management pathways.
- There will be high patient satisfaction with the service.
- There will be high staff satisfaction with the service.
- Clear administration pathways will be set up.
- Virtual triage service will continue to be an option for patients after current restrictions are lifted.

METHODOLOGY

All patients on the waiting list for two of our hip/ knee orthopaedic consultants were sent information letters about our new Virtual Knee Assessment Service and invited to opt in. A dedicated email address was set

up for all communication related to scheduling the appointments. Once patients opted in, they were offered an appointment for a video consultation within 2-4 weeks. An updated weight bearing X-ray was organised if required. The patients were assessed by a clinical specialist physiotherapist (CSP) who works closely with the orthopaedic consultants. They were provided with a diagnosis of their problem and management options were explained including advice, physiotherapy, intra-articular corticosteroid knee injection, orthopaedic team review regarding possible surgical intervention.

Patients

Number of patients offered the service: 191

Number of patients opted in: 79

% opt in rate =41.4%

Number seen to date: 59

Male / female male 58% (n=34), female 42% (n=25)

Age: mean: 63; Median; 63; Std Deviation 8.033, range 50-83

Management:

Physiotherapy: 71% (n=42)

Injection: 41% (n=24)

Ortho review re possible surgical intervention: 15% (n=9)

Overall outcome:

Injection clinic RV 41% (n=24)

Ortho clinic review 15% (n=9) (Arthroscopy n=1, TKR (total knee replacement) n=5, Other n=3)

Discharged: Total discharged: 44% (n=26)

Advice & DC 10% (n=6)

Physiotherapy & DC 34% (n=20)

Patient feedback:

- Feedback link sent to all patients after their virtual appointment.
- 30 responses by 12/12/20
- 100% satisfied or very satisfied with the process of logging in, sound and video quality.
- 100% agreed or strongly agreed that they felt at ease asking questions, talking to the clinician.
- 100% agreed or strongly agreed that they were provided with clear information about their diagnosis and management plan.
- 83% live > 30 minutes travel from the hospital.
- 90% stated no concerns with future virtual consultations.

Patient comments on feedback evaluation form:

- Completed evaluation forms by administering questionnaires to service users:

Patient reported benefits:

- ✓ "Less scary and I got the appointment quicker"
- ✓ "Less travel"
- ✓ "Seem much better way to do business where hands-on exam not required"
- ✓ "Speeded things up I feel"
- ✓ "Time factor"
- ✓ "Time saving and less hassle"

Suggested improvements:

- ✓ "Maybe email or post a brief diagnosis afterwards"
- We also contacted patients that did not opt into the service to see if we could make any improvements to buy in:
 - ✓ "got the letter but misplaced it"
 - ✓ "busy looking after sick parents"
 - ✓ "no experience with technology & no interest"
 - ✓ "don't know how it could work"
 - ✓ "already had an appointment in clinic"
 - ✓ "little English, couldn't understand"

MAIN FINDINGS

- Clear management pathways for patients with definite plan in place for all patients at the end of their consultation.
- High patient satisfaction.
- High administrative workload related to virtual clinics. Time in motion analysis shows the administrative workload involved compared to face to face clinics. Administrative workload related to the booking and registration of the patients for the virtual clinic is being done by the two CSP's running the service, to ensure the service got off the ground.

Time on booking and completing virtual assessments versus face to face appointments:

(Red font denotes administrative duties that are currently being completed by Clinical Specialist Physiotherapist due to lack of administrative resources)

Virtual OA knee clinic tasks					
	Task	Time (minutes)			
		Admin	Ortho	Physio	
	<u>Booking patients</u>				
Physio	add patient to the SPSS database baseline			3	
Admin	send opt in letter, PIL and Oxford scale and address envelope	5			
Admin	check email and reply to opt in with appt offer	5			
Physio	Update SPSS database with opt in			3	
Admin	send Tpro invite	2			
Admin	email BJU to book on PAS	2			
Admin	Book on PAS	2			
Admin	Email ortho to check if for x-ray	2			
Ortho	Check if Xray required and request on PRP		5		
Admin	email radiology to send out appt for Xray before the consultation	2			
		20	5	6	total prep time
	<u>Clinic appointment</u>				
Physio	login and connect with the patient			3	
admin	check contact details, NOK , GP info etc with patient	5			
physio	assess patient and advise re management			30	
Physio	data entry SPSS, NCP, PDMS			6	
Physio	Dictate			3	
Physio	Make Physio chart / PCCC referral			3	
Admin	review appt at PC clinic	3			
Admin	register patient and make chart	5			
		13	0	42	Total appt time

Face to face OA knee clinic tasks						
	Task	Time minutes				
	<u>Booking patients</u>	Admin	Ortho	Physio		
Admin	Send appointment	3				
Admin	Book on PAS	2				
Ortho	Xray request by Ortho team		2			
		5	2	0	7	Total prep time
	<u>Clinic appt</u>					
admin	register patient check NOK etc and make chart	5				
physio	Assess patient and advise re management			18		
Physio	Data entry SPSS PDMS			6		
Physio	Dictate			3		
Physio	Make Physio chart / PCCC referral			3		
Admin	review appt at PC clinic	3				
		8	0	30		total appt 38 time

DETAILS OF CHANGES IMPLEMENTED

- Information letter inviting patients to opt-in to the virtual knee assessment clinic was developed by the CSP's, orthopaedic consultants and administration team.
- Detailed patient information leaflet developed on preparation for and connecting to virtual consultation.
- Standardised virtual assessment form developed.
- Standardised operational procedure document on virtual musculoskeletal triage clinic developed.
- Administration pathways developed in consultation with admin team.
- Dedicated email address set up for communication with patients for the service.
- Clinical management pathways for patients agreed with orthopaedic consultant.
- Patient feedback questionnaire developed with Clinical Audit Department.

- Process for requesting X-Rays agreed with Orthopaedic NCHD's and radiology admin team.
- Capacity/Demand analysis identified the median weekly OA knee new patient referral rate to Orthopaedic service per week is 15. Demand for virtual service at 41% opt-in rate is 6-7 NP (new patient) slots per week.

STAKEHOLDER ENGAGEMENT

Communication plan with team stakeholders:

Stakeholder	Initial support	Level of influence	Key Concern	Steps to getting buy in
Ortho Consultant	H	H	Increased referral of patients into Orthopaedic clinic for surgical review and injections	<ul style="list-style-type: none"> • Meet to discuss pathway and logistics of clinic • Feedback on success of outcome of clinic • Write up on success of clinic
Admin Grade 6	H	H	Increased Workload for reception	<ul style="list-style-type: none"> • Meet to discuss the clinic pathway • Highlight reduced admin involvement required as MAC clinics are not running as per normal and this is an opt in service (i.e. up to 30% of patients will opt into clinic)
Physio Manager	M	M	<ul style="list-style-type: none"> • CSP will spend more time doing administration 	<ul style="list-style-type: none"> • Meet and involve her from the start • Submission of clinic stats • Keep updated on progress
Admin Grade 4	M	M	<ul style="list-style-type: none"> • Increased workload • Change in work practice (opt in virtual clinic service) 	<ul style="list-style-type: none"> • Meet and involve from the start • Clear communication on how the clinic will run and job roles/responsibilities
Radiology	L	M	Increase in referrals to X-ray	<ul style="list-style-type: none"> • Communicate service plan and improved care benefits • Patients will be X-ray at appointments only given directly from the radiology department

STRUCTURES OR IMPROVEMENTS TO HELP SUSTAIN IMPROVEMENTS

- Monthly communication meeting has been set up with Orthopaedic consultants and Administration Team to review activity and issues with the virtual clinic.
- Ortho NCHD's have taken over the process of checking and ordering X-rays as required.
- Administration team to take over the administration responsibilities related to the virtual clinic when normal service resumes in OPD.
- Dedicated laptops have been procured for virtual assessments, reducing the pressure on limited clinical space and PCs.
- Plan: future audit of patients who were referred onto Orthopaedic clinic to identify surgical conversion rate.

ENTRY 4

QI PROJECT TITLE	Diagnosing the presence of Atrial Fibrillation and other cardiac abnormalities in patients who present with Acute Stroke and TIA in Connolly Hospital using 72 hour Holter Monitors"
PROJECT LEAD(S)	Lisa Donaghy (Stroke CNS)
PROJECT TEAM	Dr Eamon Dolan (Consultant), Dr Marie O'Connor (Consultant), Dr Avril Beirne (Consultant), Dr Patricia Guilfoyle (Consultant) and the Cardiac Diagnostics Department.
ORGANISATION	Connolly Hospital Blanchardstown
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

Connolly Hospital's catchment area extends from CHO Dublin North City & County into Meath and North Kildare. The Stroke Service in Connolly Hospital offers a Monday to Friday daytime service. The service was re-developed in July 2017 with the appointment of a Stroke CNS in September 2017. Since then, the CNS has worked closely with the Stroke team and the key stakeholders to improve door to assessment and treatment times, swallow screening, patient education etc. An 8 bedded Acute Stroke Unit was officially opened in December 2018 by An Taoiseach, Mr. Leo Varadkar.

OBJECTIVES

The next focus of the Stroke Service was to review the pathway involved in the Stroke Work Up. Connolly Hospital treat up to 300 patients annually presenting with Stroke. Approximately 30% of these patients have either a history of Atrial Fibrillation or a new diagnosis following investigations. The presence of Atrial Fibrillation undiagnosed, thus untreated, associates a significant risk for the recurrence of Stroke in the future.

The purpose of this project was to determine the presence of Atrial Fibrillation and other cardiac abnormalities in a timely manner, which could assist with the aetiology and treatment of the Stroke. A prompt diagnosis allows the Stroke team to review and alter medications, which reduces the risk of the recurrence of Stroke in the future, promoting patient safety and best possible outcomes.

Holter monitors are in high demand for the investigation of various medical conditions other than Stroke such as syncope, palpitations, dizziness, etc. Due to this demand, an outpatient waiting list could often exceed 4 months. Additionally, a Holter monitor was not available for inpatients unless an outpatient did not attend the appointment. As previously stated, this posed a risk for the patients who waited a prolonged length

of time for the diagnosis of Atrial Fibrillation, thus increasing the risk of Stroke recurring. Therefore, the original pathway directed teams to order telemetry for these patients to obtain up to 24 hours of cardiac monitoring to ascertain any abnormalities whilst the patient is in hospital in order to diagnose and treat promptly and accurately.

DETAILS OF CHANGES IMPLEMENTED

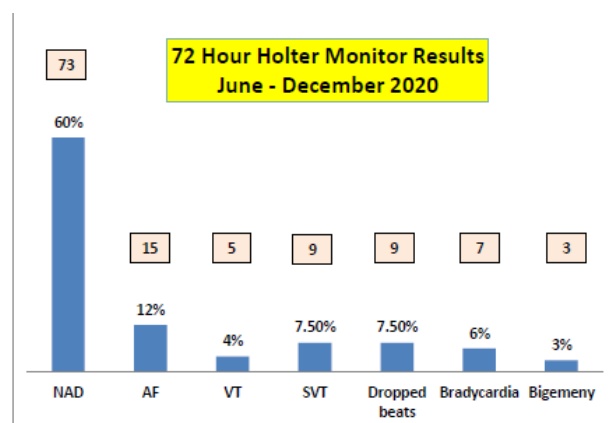
A fundraiser was organised to raise money for the Stroke Service in Connolly Hospital. The Castleknock 5km run was organised by Ms. Kate O'Neill in June 2019, who was a relative of a patient admitted previously under the Stroke Team. Some of the money raised was used to purchase 4 Holter Monitors solely for the Stroke Service, in which the Stroke CNS would manage and lead. Each monitor allows cardiac monitoring for up to 7 days if required. Up to 8 monitors is applied per week or as required. In the majority of cases, the monitor is applied as an inpatient and sent home with the patient who drops it back into the hospital for analysis.

The CNS consulted with the Stroke Team and the Cardiac Diagnostics Team to implement a pathway for ordering and analysing the monitors. The Stroke Team would order the 72 hour Holter on NIMIS and inform the Stroke CNS. The CNS would apply the Holter and inform the patient of the rationale. Additionally, the CNS would inform the patient of no showering whilst the monitor is insitu and ask them to record any symptoms that may arise in a symptom diary. Following this, the CNS contacts the Cardiac Diagnostics Department to inform them of the Holter application, and they arrive it on the NIMIS system. Once the 72 hours is recorded, the CNS removes the monitor and brings it for analysis. The Cardiac Diagnostics Team analyse the monitor in the presence of the Stroke CNS. Finally, the CNS contacts the team immediately if any abnormalities arise and treatment is commenced. The results are documented in the medical chart for future reference.

INCLUSION CRITERIA

Patients with a diagnosis of Acute Stroke or TIA who was not previously diagnosed with Atrial Fibrillation attending Connolly Hospital from June 2020 to December 2020.

RESULTS



A total of 121 monitors were applied to patients over a 6 month period (June to December 2020). As illustrated in the graph above, 60% showed no obvious abnormalities. Whilst this is indicative of a normal reading, it provides a wealth of information for the team. It allows the team to decide to repeat the monitor or refer for a loop recorder if there is a clinical suspicion of Atrial Fibrillation or other abnormalities or to out rule cardiac as the aetiology of the Stroke.

The project demonstrated that 12% (n=15) of patients had a new diagnosis of Atrial Fibrillation, allowing medication to be prescribed promptly. Additionally, 28% of patients had other cardiac abnormalities such as VT, SVT, dropped beats, Bradycardia and Bigeminy. Whilst these abnormalities may not always contribute to a Stroke, it allowed the Stroke team to review patients' medication and blood tests which may contribute to these abnormalities.

BENEFITS FOR THE PATIENT AND SERVICE

- ✓ Abnormalities are detected promptly (within 1 week of hospital admission) and an accurate treatment plan can be prescribed to reduce the risk of Stroke in the future.
- ✓ Bypass telemetry beds – only 8 telemetry beds were utilised for Stroke patients during this 6 month project. These patients were primarily allocated a telemetry bed following Thrombolysis or Thrombectomy, which remains the pathway currently. The avoidance of telemetry bed allocation reduces pressure for bed management to allocate telemetry beds for Stroke patients, in particular throughout the Covid 19 pandemic. Additionally, it ensures the prompt transfer of the Stroke patient from the Emergency Department to the Acute Stroke Unit, improving the compliance with the national KPI
- ✓ Reduces length of stay as the monitor can be sent home with the patient with written instructions on when and where to return it.
- ✓ Can be applied as an inpatient or an outpatient
- ✓ Flexibility to repeat monitors if required

ENTRY 5

QI PROJECT TITLE	Enhancing patient visibility and safety on a Covid ward
PROJECT LEAD(S)	Bernie Waterhouse, Clinical Nurse Manager II; Anthony Galvin, Clinical Nurse Manager I. Christopher Soraghan - Medical Physics Dept.
PROJECT TEAM	Covid 19 Ward Nursing Staff
ORGANISATION(S)	St James's Hospital, Dublin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

OBJECTIVE

To improve monitoring, visibility and safety of patients in single rooms in a Covid 19 ward.

When we first opened the Covid 19 ward at the start of the pandemic, it was difficult to monitor patients in single rooms as the rooms had solid doors. Additionally patients could only be monitored/ seen if a health professional donned full PPE and entered the room. At the start of the pandemic our access to PPE supplies was very limited.

We also needed a way to care for patients requiring constant supervision e.g. due to confusion, falls risk etc. without having someone beside the patient at all times to limit staff exposure to Covid 19.

We were also responding to clinical situations and adverse incident reports. One patient fell in a single room but staff were unaware they had fallen until the nurse had checked on the patient sometime later. Another patient needed emergency suctioning but could not be easily monitored as the solid door preventing us from seeing the patient, thus compromising response time to the patient's needs.

To address the above we

- Removed solid doors
- Installed doors with frosted glass panel and spy hole (to maintain patient privacy and dignity)
- Installed convex mirrors facing the patient that can be seen from the door by nursing staff
- Used video monitors (for patient's requiring constant supervision)

FINDINGS/RESULTS

A staff survey was used to evaluate our interventions. Responses were positive with increased ability to monitor patients noted by staff. Adjustments were made to the

positioned mirrors based on feedback.

Four patients were interviewed about the changes implement and stated that they supported the changes and did not have concerns around privacy and felt reassured about increased ability of nurses to support them.

DETAILS OF THE CHANGES IMPLEMENTED

- We engaged with The Technical Services Department to have new doors purchased and installed.
- We engaged with the Medical Physics Department to co-design a solution to our issue and trialled one wall mounted convex mirror to improve visibility of the patient from outside the room. The trial was run for one week to assess suitability and then rolled out the solution for all ten patient side rooms.
- We sourced video monitors (baby monitors) to use for patients that required constant supervision to permit observation by Health Care Assistants outside the room.

STAKEHOLDER ENGAGEMENT

To make these improvements we met with our Quality Safety Improvement Department Director, and Medical Physics department engineer and nursing staff on the Covid ward to assess the environment and brain storm ideas and have sign off on any risk related issues with our plan.

SUSTAINING IMPROVEMENT

The interventions we have made were established on our ward and have since been implemented successfully on two other wards further demonstrating its effectiveness and sustainability.

ENTRY 6

QI PROJECT TITLE	Fast track pathway for degenerative cervical myelopathy
PROJECT LEAD(S)	Caroline Treanor & Warren Lenehan
PROJECT TEAM	Dept of Neurosurgery and Physiotherapy
ORGANISATION(S)	Beaumont Hospital, Dublin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

The systematic profiling of OPD referrals to the national neurosurgical service has identified that 60% of OPD referrals are for patients with spinal pathology and that 60% of all spinal referrals are appropriate for review by specialist physiotherapists working under the clinical governance of a consultant neurosurgeon in spinal assessment clinics embedded within the consultant clinics. Degenerative Cervical Myelopathy (DCM) is a devastating, potentially irreversible condition and represents the most serious degenerative cervical spine pathology seen in the spinal assessment clinics. DCM is the number one cause of spinal cord impairment globally, affecting as many as 2% of adult populations. DCM is a spinal cord injury which tends to occur in slow motion secondary to degenerative compression of the cervical spine. Despite treatment, less than 5% of people with DCM make a full recovery. Many will have life-long disability and some of the lowest quality of life scores for long-term conditions. Surgery is the recommended treatment for patients with moderate or severe DCM. In Ireland people with symptomatic degenerative spinal conditions including suspected DCM who are referred for a surgical assessment often face long wait times, particularly if their presentation is deemed non-urgent. In 2019, 8 patients seen in the clinical specialist physiotherapy clinics that were given a clinical diagnosis of DCM had an average wait time of 75 weeks. Long waits are associated with diagnostic and treatment delay, which is very common in patients with DCM which negatively impacts both patient experience and outcome.

OBJECTIVES

The objective of this project was to improve the outpatient wait times for patients reviewed in the spinal assessment clinics in the national neurosurgical service with suspected degenerative cervical myelopathy to less than 6 weeks by the end of 2020.

FINDINGS/RESULTS

24/654 patients (~3.7% of 2020 total) were identified from triage by the specialist physiotherapy team as suitable for an urgent appointment via the Fast-track DCM

pathway with an average waiting time of 50 days (Range 18-77). 4/24 patients (16.7%) were subsequently diagnosed with DCM following urgent clinical examination and had an average wait time of 5.6 weeks. The conversion rate to urgent surgical decompression was 8.3% (2/24). 15/24 patients (62.5%) were discharged following their initial clinical review and 3/24 patients (12.5%) were provided with surveillance review appointment. There were no patients diagnosed with DCM in the spinal assessment clinics that were not identified and thus provided with an urgent appointment via the DCM fast track pathway.

DETAILS OF THE CHANGES IMPLEMENTED

A process mapping exercise was undertaken to map the current pathway for patients with DCM. A root causes analysis was undertaken to better understand the factors which were contributing to the wait times for patients with DCM. Referral triage was a multi-step process and process measures were introduced to capture the time taken for each step in the process. Our first change strategy was to develop and test the impact of a fast track pathway for patients developed in collaboration with the consultant neurosurgeons for patients with suspected DCM. The pathway involved specialist physiotherapists undertaking paper triage of all the referrals deemed appropriate for review in the spinal assessment clinics using agreed criteria based on the most up to date clinical guidelines with protected clinic slots to ensure a timely clinical review. When we studied the impact of the fast track pathway, although the pathway was very effective at identifying all cases of patients with DCM, the criteria that we were using resulted in a significant number of false positives. It was often difficult to establish if patients had suspected DCM from the referral letters and the threshold for fast tracking patients was different between clinicians. We were also fast-tracking patients with mild stable DCM who do not require urgent surgical decompression. We subsequently reviewed the referral letters of patients with confirmed DCM following their clinical assessment and those who had the diagnosis excluded. We also put in place a system to identify any patients diagnosed with DCM who had not been flagged and fast tracked on the initial paper triage of their referral. We used this feedback to further refine our criteria to increase the accuracy of our paper triage. We also introduced the mandatory completion of the Modified Japanese Orthopaedic Index (mJOA), a validated outcome measure used to grade myelopathy severity, on the initial clinical assessment of all patients with suspected DCM, to help inform the clinical decision making process.

STAKEHOLDER ENGAGEMENT

One of the project leads is a member and ambassador for the RECODE DCM project which is a global multi-stakeholder initiative which was formed to establish for the first time an index term, minimum dataset, and research priorities for DCM. This process has been supported by the James Lind Alliance (JLA), an organisation supporting the definition of research priorities by mediating "Priority Setting Partnerships" (PSP), which aim to involve multiple stakeholders, including those affected by the condition, their carers, and health professionals.

For the purpose of the design, consultation and implementation of the Fast-track DCM pathway we involved all relevant stakeholders including the Neurosurgical consultants, clinical specialist physiotherapist team and the booking staff in the Neurosurgical access office.

SUSTAINING IMPROVEMENT

The improvement has been sustained by the development of a standard operating procedure, which has been through multiple iterations to support the implementation of the fast track pathway as it has evolved. The SOP includes details of outcome, process and balancing measures which have been used to continuously study, revise and improve the pathway. The neurosurgical specialist physiotherapy team have regular team meetings which facilitates regular discussions and collective problem solving. This has ensured that all team members have been involved in the development of the pathway from the outset and informed and engaged throughout the implementation process.

ENTRY 7 – HIGHLY COMMENDED

QI PROJECT TITLE	Getting the balance right for families: managing low blood sugars in newborn infants in a maternity setting
PROJECT LEAD(S)	Dr Anna Curley
PROJECT TEAM	Dr Ibrahim Dafalla, Dr Sarah Kasha, Ms Avril Kearney, Dr Anna Curley, Ms Hilda Wall
ORGANISATION(S)	Neonatal Department, National Maternity Hospital, Dublin 2, Dublin, Ireland.
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND & OBJECTIVES

Hypoglycaemia (low blood sugar) is one of the commonest problems in newborn infants. Certain babies are at higher risk of hypoglycaemia and early identification can reduce risk of persistent brain injury and life-long consequences for babies and families.

The background objectives of our hypoglycaemia programme which was first devised in 2016 by a multidisciplinary collaborative group of health care professionals was primarily to prevent avoidable brain damage. We hoped to achieve this by:

- Identifying high risk babies
- Targeting blood sugar testing
- Developing an education programme to help staff understand hypoglycaemia management

We also hoped to increase breastfeeding rates by using Glucogel (concentrated sugar gel) instead of infant formula.

At the time our focus was largely medical: to prevent hypoglycaemia. By our 2017 audit we were identifying babies better. In the meantime the Antenatal team caring for women with diabetes were encouraging women with diabetes to express milk for their babies before birth and we were building up our lactation support on the neonatal unit and wards. The PRIME (PReterm babies need breastMilk Early) project which was active at the time in the neonatal unit and wards also encouraged early expression of breast milk for all premature babies.

Subsequent audits showed that babies were safer, i.e. we were achieving our aims of reducing the risk of severe or prolonged low blood sugar in babies. Breastfeeding rates weren't improving however and introduction of Glucogel had not had the effect we wanted it to achieve.

We started to notice through our PRIME focus groups with mothers and parent feedback questionnaires for SCBU that achieving our medical aims came at a significant cost to families. Audit showed we had increased the number of symptom free babies having blood tests and the rate of mother-baby separation through admission to special care. Babies were more likely to be given intravenous (IV) fluids and go home exclusively formula fed in an effort to get them off fluids. We had to start again, and somehow make care safe but family centred.

Our first 6 month audit in 2020 therefore concentrated only on newborn babies admitted with to the special care with hypoglycaemia as the primary reason for admission. Of the 3800 babies delivered in NMH in the audit time frame 118 of these babies were admitted to the special care. 50% required IV fluids.

In Feb 2020 Kempen et al published the hypoEXIT study, which showed that when babies were treated at a lower blood sugar threshold of 2mmols/L (compared to the more standard 2.6 mmols/L we had been using) that babies' development was unchanged¹. This meant that we could lower the blood sugar level we were using to treat babies without putting them at increased risk.

Our hospital was the first in Ireland to implement this new threshold for treatment of hypoglycaemia in May 2020.

Objective: The primary objective of revising the hypoglycaemia guideline was to reduce admission of babies with hypoglycaemia to SCBU aiming to keep babies with their parents wherever possible. This became even more relevant from March 2020 with the advent of Covid 19 when limits were temporarily placed on parents visiting the special care unit.

RESULTS

We achieved a greater than two thirds reduction in the admission rate (118 vs 34 babies) resulting in decreased separation of newborn babies from their mothers, less workload for the neonatal unit, better utilization of resources, informally reported decreased parental anxiety and improved bonding and breast feeding. No babies suffered adverse effects of hypoglycaemia such as seizures in either timeframe.

STAKEHOLDER ENGAGEMENT

What we had learned early on in our project however was that failure to involve everyone involved in looking after mothers and babies, failure to educate and failure to communicate well between teams was often a factor in not meeting audit

standards. By highlighting risk during our 2016-18 education programme we had also inadvertently 'scared' staff away from a more natural approach to newborn care and feeding.

Our new programme involved a reduction in the threshold for hypoglycaemia. We knew that not treating a blood sugar between 2 and 2.6mmols would therefore make staff nervous and before we introduced the guideline and uploaded our protocol to the hospital system we carried out a hospital wide education programme, designed posters, spoke to all senior midwives and neonatal nurses who then educated their teams about the new protocol.

Midwives who were concerned about the change in practice or wanted to make sure they were applying the guideline safely were encouraged to discuss the babies care with neonatal consultant (Dr Curley) who would then explain how the protocol should be implemented. Feedback from staff showed overwhelming support for the new protocol which kept babies on the ward and halved the number of blood tests performed.

The programme was run in parallel with increased lactation support and parents fed back to us through our parent groups and questionnaires (monthly) that they felt more supported. Parents also told us that our approach to supporting breastfeeding had improved.

SUSTAINING CHANGE

Our improvement is likely to be sustained because of the strong emphasis on education and involvement of teams in all areas. By helping women to breastfeed successfully we know that they are more likely to breastfeed their next infant leading to positive effects of our programme well in to the future.

SUMMARY

We used our local clinical audit data to improve care of babies with hypoglycaemia in our maternity hospital. We found that listening to parents and therefore quickly embracing the most up to date clinical evidence around management of low blood sugar in babies allowed us to make our care better. The lessons we learned can be applied to other maternity hospitals in Ireland and we hope will reduce mother and baby separation and enhance bonding and breastfeeding improving maternity and newborn care.

Kempen, A. A., Eskes, P. F., Nuytemans, D. H., Lee, J. H., et al. Lower versus Traditional Treatment Threshold for Neonatal Hypoglycaemia. *New England Journal of Medicine* 2020; 382(6), 534-544.

ENTRY 8 – HIGHLY COMMENDED

QI PROJECT TITLE	Improving IHFD Hip Fracture Standard 1 - patient's admission times to bed
PROJECT LEADS	Mary Mullen, ANP, Ortho-Geriatrics; Dr Sandra O' Malley, Orthopaedic SHO; Mr Keith Synnott, Consultant Orthopaedic Surgeon; Dr Vinny Raminah, Consultant ED Physician; Prof Joe Duggan, Consultant Geriatrician; Dr Liz Callaly, Consultant Geriatrician; Ms Ruth Buckley, Quality Manager; Ms Karen Fitzpatrick, Data Co-Ordination Lead.
PROJECT TEAM	MMUH Hip fracture Governance Committee
ORGANISATION	Mater Misericordiae University Hospital, Dublin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

OBJECTIVE

Hip fractures are a common injury seen in older adults and are associated with increased morbidity/mortality coupled with spiralling costs to an already overburdened health system. The Irish Hip Fracture Database is a web based clinical audit which measures hip fracture care, initiates secondary prevention and ultimately informs MDT to improve patient outcomes. This is achieved through benchmarking six clinical key performance indicators (KPI's) along with two non-clinical KPI's (NOCA, 2020). Our IHFD clinical audit data in 2018 showed only 1% of patients within the Mater University Hospital (MMUH) achieved Standard 1.

The local hip governance committee set an aim to admit patients to the orthopaedic ward/direct to theatre within four hours of initial registration.

Our first objective was to interrogate the data for accuracy and explore potential gaps and areas for improvement across the pathway. The second objective was to secure and maintain a protected hip bed. Finally, our third objective was to assess how we communicated as a team.

We also identified the need to evaluate our team performance across the pathway. The hip fracture pathway is dependent on five specialities: ED, Orthopaedic Surgery, Theatre, Ortho-Geriatrics and Physiotherapy. Effective communication is paramount within the stakeholder group to ensure a safe, timely transfer of patients to the ward. Proactive discussions and cross examination of our audit data continued at the local hip governance committee meetings. The committee questioned what changes could be made resulting in greater and sustained improvement.

METHODS

We created a process for collecting real-time data on the hip fracture pathway. Using Dendrite Intellect software programme we developed a current audit tool to manage hip fracture patients, enabling greater data analysis and measurement of improvements in real time.

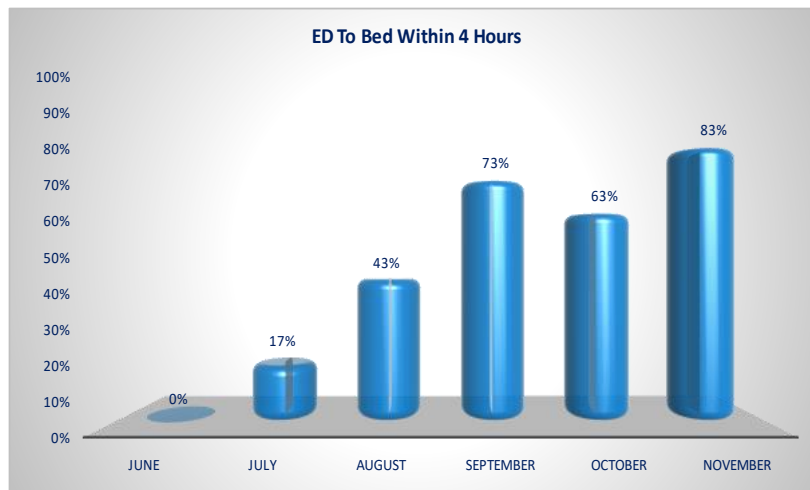
Secondly we migrated from the traditional referral/communication method via phone/bleep to a more robust phone messaging application (app) called SILO. This was employed as the means to improve communication and enhance team performance. We created a hip fracture pathway group on SILO with all key MDT stakeholders and specialities involved. This provided us with a secure, live communication hub, accessible to stakeholders via their mobile phone.

FINDINGS/RESULTS

SILO allowed us create a sense of urgency pertaining to the hip fracture pathway and over time we started to see improvements, results and we began to function better as a team. SILO has increased efficiency within the hip fracture pathway with better, faster decision making through direct knowledge exchange, engaging the entire group simultaneously.

At the most recent hip governance meeting live data courtesy of the Dendrite Intellect programme outlined how we had made significant progress in getting patients to the orthopaedic bed within four hours. The below graph confirms a huge

improvement in Standard 1 from 17% in July to 83 % in September.



DETAILS OF CHANGES IMPLEMENTED

Based on the PDSA cycle our approach was twofold. Initially we reviewed the way data was collected within the MMUH over the period of 2019 to include the first six months of 2020. On completion of this we recognised that live data was paramount to the success of this pathway. On foot of this a Dendrite Intellect Programme was designed and launched by the hospital's Data Co-Ordination Lead which allowed us view live data on a daily/weekly basis. This was instrumental within the hip fracture pathway as we then had live audit data which allowed us to see how the hospital was performing at any one time while facilitating ongoing changes to enhance the patient's journey and experience.

Using SILO as a team, we developed a communication platform among healthcare professionals involved in the care of hip fracture patients from the initial presentation of a patient with a hip fracture in the Emergency Department (ED). SILO based messaging is a catalyst for stakeholder collaboration and has enhanced greater dialogue within the hip fracture group. The SILO Messenger App is a secure method for exchanging information, is GDPR compliant and healthcare specific.

STAKEHOLDER ENGAGEMENT

The orthopaedic team pioneered and championed this messaging app change and it is now being rolled out to other teams within the MMUH. To date 1100 MMUH staff members have downloaded and are registered on the app.

With each radiologically confirmed hip fracture patient that presents in ED, an alert notifies all stakeholders within the group that there is a new hip fracture patient in ED. A “case” is created by our ED colleagues which outlines past medical history, medications etc. and includes diagnostic imaging. This informs all stakeholders and enables faster decision making and identification of the requirement of a theatre slot and inpatient bed. The current Hip Fracture group on SILO consists of MDT members with access to the group approved and edited by various administrators appointed from different disciplines and teams. This application acts as a patient management tool with current stakeholders including: ED medics, orthopaedic team, theatre, anaesthetics, Patient Flow, St Agnes Ward, Orthogeriatrics Advanced Nurse Practitioner/Registrar and physiotherapist.

As a means of ongoing audit within this messaging application and with the objective of improving patient outcomes, the Site Nurse Managers were included as they can negotiate access to the bed outside of normal working hours ensuring this is accessible 24 hours. In addition we are in discussion with the app developers to determine if further changes to the app could be made for the hip fracture group. For example implementing a ticking clock counting the time to bed and theatre.

CONCLUSION

Launching the Dendrite Intellect programme has allowed us capture and explore live data, informing gaps in the process and opportunities for improvement.

The implementation of the SILO messaging app has enhanced our communication across specialities. Real-time messaging delivered to all stakeholders simultaneously, has driven this necessary change achieving our aim of the patient accessing the bed within 4 hours. SILO has acted as a secure communication tool, co-ordinating care while accelerating decision making, co-ordinates care with appropriate stakeholders for hip fracture patients. A cohesive team dynamic has been established that ensures timely management of this patient cohort and enhanced patient care.

SILO supports and echoes both NOCA's and Sláintecare's goals with right care, right place, right time and right team all involved in this pathway.

ENTRY 9

QI PROJECT TITLE	Introduction of Beta D-Glucan Testing
PROJECT LEAD(S)	Dr Breda Lynch
PROJECT TEAM	Dominic Gilmore, Fiona Hegarty, Nuala Scanlon, Leah Colclough, Louise O'Sullivan, Assumpta Killarney
ORGANISATION(S)	Mater Misericordiae University Hospital and HSE Spark Fund
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

This QI project followed from a clinical audit undertaken by the project lead on the TAT and utility of BDG testing performed at an external reference laboratory. That audit of 23 results undertaken in 2019 demonstrated a delay in receipt of results to an average of 109.5 days, but up to 510 days, where 2 of 23 results were not received. Utility of the test could not be undertaken as the delayed TAT was such that it precluded having an impact on patient management.

AIMS & OBJECTIVES

Repatriation of a laboratory test called a beta-D-glucan (BDG) to be performed in-house.

- Improve diagnosis or out-ruling of fungal disease for patients
- Improve turn-around time (TAT) from current 109 days to less than 3 days
- Reduce unnecessary antifungal use.

METHOD

Equipment was procured and laboratory staff training and test evaluation was undertaken. An audit of the first 262 tests was undertaken.

RESULTS

Total number of samples 262: 87 positive tests and 175 negative.

Positive results

Twenty-five positive results contributed to the diagnosis and early treatment of patients with confirmed fungal infections. Sixty-one results were in patients with a diagnosis of a fungal infection following response to treatment. One positive result was in a patient who died secondary to sepsis before the result was clinically evaluated.

Negative results

Thirty-two negative results directly contributed to either stopping or preventing an antifungal prescription, resulting in a saving of €81,064 on antifungal therapy. A further 87 negative samples contributed to the avoidance of empiric antifungal therapy in patients with sepsis of unknown origin or risk factors for fungal infection. Twenty-one of 175 (12%) negative tests did not result in de-escalation of antifungal therapy. Twenty of these patients were reviewed by the Clinical Microbiology or Infectious Diseases team and antifungal therapy continued because of a high clinical suspicion for fungal infection. Eight of those patients were diagnosed with COVID-19 infection and as the natural history of COVID-19 infection was not entirely understood, it was appropriate to continue empirical antifungal. Four of the other cases were care of haematology or transplant with sepsis of unknown origin and 2 patients had alternative indications for antifungal therapy (prophylaxis post lung transplant and oesophageal candidiasis). Twenty-six tests were repeat negatives for follow up or ongoing screening. Three patients died prior to the result being available.

Test performance

Two tests were deemed falsely negative and one test deemed falsely positive. Analysis of results (excluding repeat testing) determined sensitivity of BDG in-house to be 92.9%, specificity 99.3%, with a positive predictive value of 96.3% and negative predictive value of 98.6%. Turn-around time (TAT): By repatriating testing to in-house, on average results were available after 1.1 days, with a range <1 - 7 days with only 21 of 262 results taking >2 days. The delay in up to 7 days was as a result of the unprecedented impact of SARS-CoV-2 in March and April, 2020.

DELIVERED OUTCOMES

- a. Diagnosis or out-ruling of fungal disease for patients achieved: Analysis demonstrates sensitivity of 92.9%, specificity of 99.3%, with a positive and negative predictive value of 96.3% and 98.6% respectively
- b. Improved TAT to less than 3 days achieved: TAT now average 1 day, range <1 -7 days with only 21 of 262 results taking >2days
- c. Reduction of unnecessary antifungal use achieved: €81,064 saved in anti-fungal expenditure as a direct result of BDG

BENEFITS OF THE PROJECT

1. Improved patient care: Improving diagnostics improves patient outcomes due to earlier targeted therapy, or the reduction of unnecessary therapy. The use of evidence based diagnostics allows for improved treatments, reducing morbidity and mortality. Twenty-five patients had a positive BDG result that directly contributed to the diagnosis of their fungal infection. Thirty-two patients had a negative result out-ruling a fungal infection, allowing their antifungal therapy to be stopped, sparing them the side-effects of unnecessary therapy.

Test availability, short TAT and excellent test performance allowed for improvement in patient care

2. Antimicrobial stewardship (AMS) gains AMS is the promotion of the correct use of antimicrobials to improve patient outcomes and reduce development of resistance. As fungal infections are difficult to diagnose with a high mortality associated with delaying treatment, empirical treatment is frequently initiated pending results. The BDG test is an ideal AMS tool as the high negative predictive value allows clinicians to confidently stop empiric therapy. Thirty two patients had their antifungal therapy stopped saving €81,064 in anti-fungal expenditure
3. Novelty, potential to scale and transfer learning; at present, no Irish hospital laboratory is performing this test, although recommended by international practice guidelines. Our laboratory has the ability to provide tests to other Irish hospitals in the future. The results of this project were presented to the Irish Society of Clinical Microbiology raising awareness of test utility and availability.
4. Collaboration and multidisciplinary input; Collaboration between Clinical Microbiology, the laboratory and healthcare providers improves clinician experiences and delivers a more effective service. Many of the patients in whom a BDG test was indicated were those in whom the Clinical Microbiology team are members of the multi-disciplinary team (MDT). A large proportion of tests were undertaken on patients in the Intensive Care Unit and result discussed at the daily MDT ward round. Improving laboratory services and introduction of a quality improvement initiative such as this allows improved clinical care to be delivered and strengthens working relationships. Furthermore, Clinical Microbiology trainees were involved in data collection and interpretation post-implementation, thus contributing to their education and training.

STAKEHOLDERS & SUSTAINABILITY

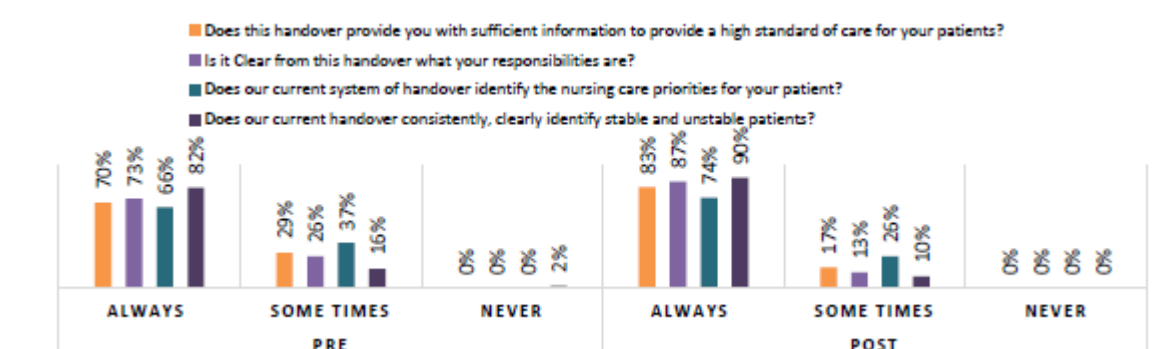
BDG will be performed in-house on an ongoing basis as the equipment is available and staff are trained. The results of this QI project have been presented to key stakeholders such as intensive care physicians as well as being circulated to hospital clinicians via an AMS newsletter. The Clinical Microbiology team, as members of many multi-disciplinary teams, will continue to utilise the test as indicated.

ENTRY 10

QI PROJECT TITLE	ISBAR3
PROJECT LEAD(S)	Warren O'Brien CNM3 QI
ORGANISATION	Children's Health Ireland at Crumlin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

OBJECTIVE

The objective of this project is the introduction of a national handover bundle to standardise the handover process, improve the quality of communication, reduce time spent in handover and improve nurse satisfaction with handover. A staff survey concerning 13 elements was undertaken pre-implementation to support the basis for change, 183 respondents replied pre-implementation of ISBAR3 indicating a need for improvement across all ISBAR3 elements.



The Health Service Executive (HSE) (2018) change model '*Peoples Needs Defining Change, Health Services Change Guide*' underpinned the implementation of this QI project. Each stage of this change model; *Define, Design and Deliver* facilitated the collection of required data in conjunction with DOH (2015) Clinical handover guideline and accompanying resource bundle which was updated/amended accordingly. Recognising that change was required, based on the findings, the readiness of the nursing team was assessed for change using HSE *Readiness Factors* template (HSE, 2018). In addition, SWOT analysis was used to engage staff, with particular emphasis on the opportunities of changing their current handover practice.

Strengths

Highly skilled nursing team
Communication handover guideline DOH
Support from CMT
KPI
Training Programme Available

Weaknesses

Training Programme – recommended 4 hours
Being imposed by senior management
ISBAR tool used only for patient escalation
No electronic healthcare record

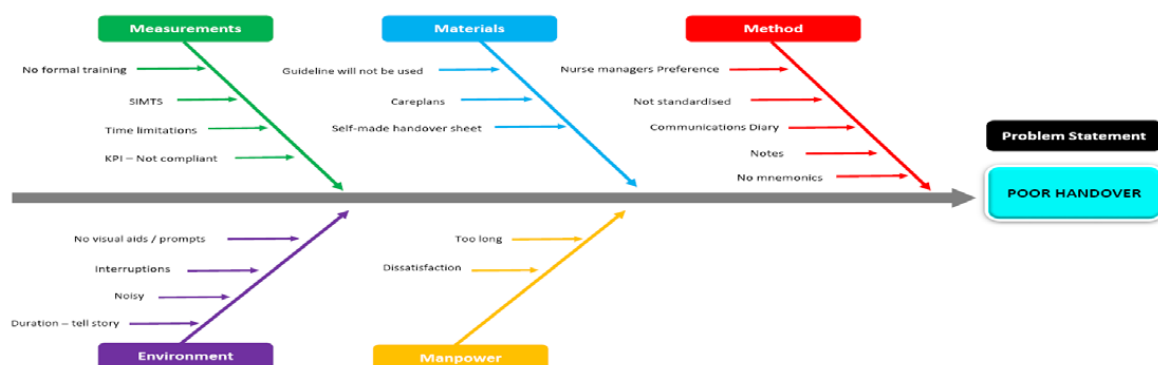
Threats

Lack of resources for training
Lack of resources for visual aids
CNM 2 dictates handover style
No electronic healthcare record

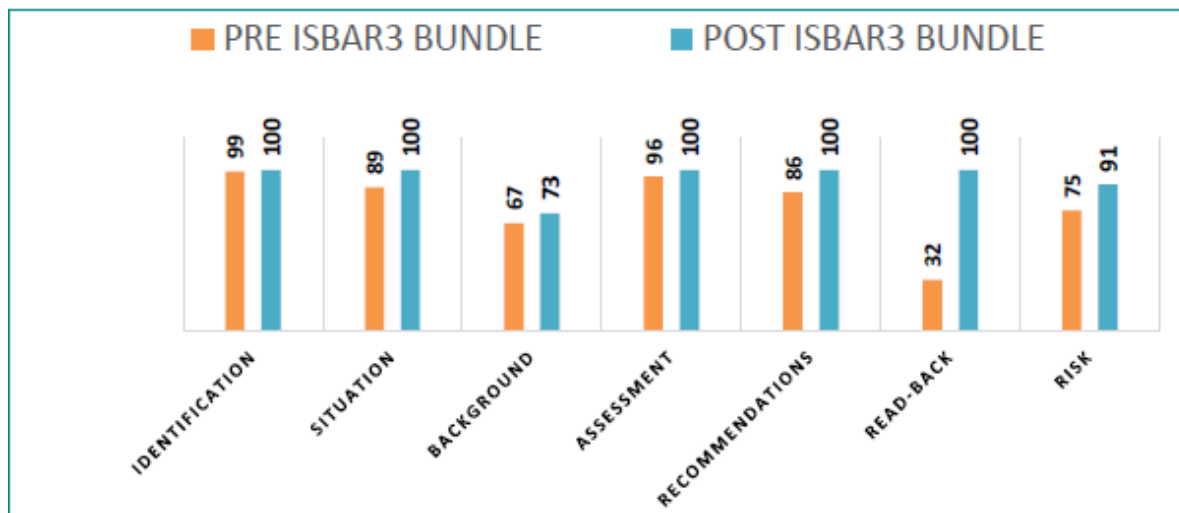
Opportunities

Improve quality of handover
Reduced handover time
Reduce handover interruptions
Increased nurse-to-nurse patient time
Improve staff satisfaction
Improve patient satisfaction

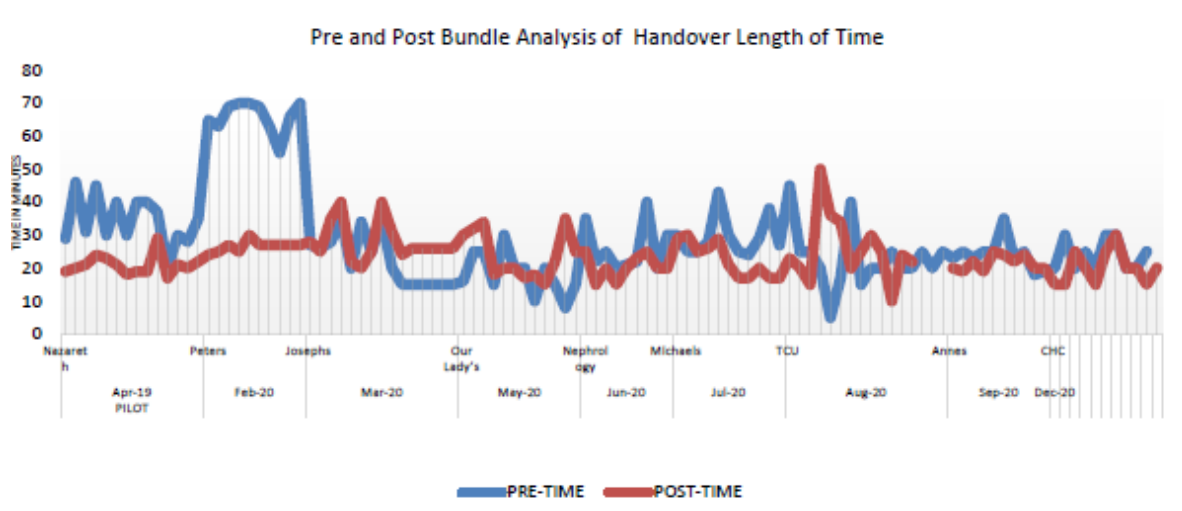
The perceived barriers to using the DoH handover guideline were determined. However, the baseline data from each clinical area audited was presented to the staff of this area to overcome various barriers identified. In order to connect the views and ideas in the room the liberating structures model was used to include everyone in shaping next steps for implementation in the various clinical areas. This ensure the tool worked for the clinical area whilst slight variation exist, the core elements of ISBAR3 where adhered too.



As part of the implementation plan efforts were made to overcome barriers identified. Which included the creation of a universal PowerPoint slide for use in education, standardization of the handover template and the creation of infographics/signage for the clinical areas.



Handovers where audit utilized the national audit tool whereby compliance/non-compliance to the core element was identified for a minimum one week in all areas. Overall, the success of utilizing a structure handover tool ensures consistency in the key pillars of information transfers, reducing the risk of omissions. This data analysis identified improvement in all areas as outlined in the above bar-chart.



Overall, the introduction of clinical handover bundle reduced handover time by 25% collectively

- Nazareth and St. Peters seen significantly higher reductions, 39% and 59% respectively
- St. Josephs and Our Lady's recorded increased durations, 23% and 30% respectively, this is attributed to significantly higher occupancy rates post ISBAR3 introduction
- Interruptions reduced by 314%, phase 1 combined total pre (n=44) post (n=14)

FUTURE DIRECTION	
DOH (2015) CLINICAL HANDOVER GUIDELINE	CHI CRUMLIN
Recommendation 2: Healthcare organisations should aim to involve the patient, parents/ guardians of children and/or carer(s)	Bedside handover in PICU, ISBAR3 implementation in progress, delays due to integration with electronic HCR
Recommendation 3: Inter-departmental and shift clinical handover should be conducted using the ISBAR3	Interdepartmental ISBAR3 tool currently on trial in Nazareth ward
Recommendation 4: Where electronic clinical handover applications and templates are in use or being developed to support face-to-face clinical handover, they should incorporate ISBAR3 for both shift and interdepartmental clinical handover and ISBAR for urgent escalation of care.	ISBAR3 templates created for both intradepartmental and interdepartmental handover. ISBAR3 in progress in ED and CHC where electronic HCR are used, however due to challenges experienced in PICU, paper based formats are being pursued.
Recommendation 6: interdisciplinary shift clinical handover where possible, to include junior and senior staff at every clinical handover during the 24 hour cycle.	General Paediatrics interdisciplinary handover occurs twice daily AM with Medical consultant, registrar, SHO, ED consultant, ED CNM3, ORTHO CNS, bed manager and ED consultant, PM with PICU representative, site nurse manager, MROC

ENTRY 11

QI PROJECT TITLE	Medication Request and Administration Record for Public Health Nursing
PROJECT LEAD(S)	Virginia Pye, National Lead for Public Health Nursing Services
PROJECT TEAM	Ina Crowley ONMSD Project Officer PHN Services Sinead Lawlor, National Practice Development Coordinator PHN Services Brenda Horgan, Practice Development Coordinator PHN, CHO 9 Olivia Byrne, RPHN Registered Nurse Prescriber CHO 2 Margaret Nally, Director of Public health Nursing CHO 8 Marie Therese Buckley Assistant Director PHN CHO 4 Fiona O'Connor Power, Assistant Director PHN, Manager Community Intervention Team CHO 7 Dr David Hanlon, Clinical Lead NSCP Division HSE Muriel Pate Medication Safety Specialist Pharmacist Eileen Whelan, Chief Director of Nursing and Midwifery Clare MacGahann, Director of Nursing (Prescribing) Lisa Mary CNM3 National Cancer Control Programme
ORGANISATIONS	Public Health Nursing Service, Community Healthcare Organisations, HSE.
CLINICAL AUDIT TYPE	Local <input type="checkbox"/> National <input checked="" type="checkbox"/>

BACKGROUND

Medication error is the most common type of error affecting patient safety. Health professionals sometimes prescribe and administer medicines in circumstances that increase the risk of harm to patients. Transitions of care increase the possibility of communication errors, which can lead to serious medication errors. Good medicines management and communication is essential to assure high standards in the clinical care of patients.

There are increasing demands on community nursing to administer more medications to patients with greater complexity of need as a result of an increasing older person population, greater chronic disease burden and earlier hospital discharges. In a clinical audit compliance with completion of the identified data fields on current medication request forms was 61.9%. There was a variety of request forms in use across the 31 Public Health Nursing (PHN) areas nationally with no national standard in place.

The clinical audit outcome necessitated the implementation of a standardised robust system of medication administration management within the national PHN service

OBJECTIVE

The aim of this project was to ensure the safe and effective management of prescriber requests to the PHN service to administer medication to patients on the community nursing caseload.

FINDINGS/RESULTS

Following the audit, the project team designed a request form and it was piloted in CHO 2. There was a local implementation group to support the pilot. An evaluation (quantitative and qualitative) was undertaken following the pilot. Alteration and adjustments were made to the form following feedback. The final version of the Medication Request and Administration Record (MRAR) was recommended to the National Advisory Group following the pilot. The accompanying policy guideline, frequently asked questions sheet and implementation plan were developed and agreed by the National Advisory Group. The Medication Request and Administration record and accompanying guideline were submitted by the group to HSE National Operations for approval - approval was received in 2020.

CHANGES IMPLEMENTED

The Medicines Request and Administration Record (MRAR) has been developed to ensure the safe, effective and timely management of prescriber requests to the Public Health Nursing Service (PHN) and/or the Community Intervention Service (CIT) service to administer medication to patients in line with professional and regulatory standards and current prescribing legislation. This form is predominantly for GPs, Hospital doctors and nurse prescribers to request the administration of medications by the PHN/CIT services. It promotes a regular review of medication to be administered at minimum every nine months in line with current legislation.

Following this project, explicit up to date written standardised request documentation is available for all patients requiring the administration of medication by the community nursing service in that patient's health care record. It provides for recording of the administration of medications by the PHN/CIT teams.

A supporting policy document was developed for users of the medication request and administration record.

It promotes a timely and a national safe process for the administration of medication by nurses employed within the PHN/CIT services.

STAKEHOLDER ENGAGEMENT

This national procedure was sponsored by the Office of Nursing and Midwifery Services Director and the National Community Operations Division. A national Advisory Group of key stakeholders and Public Health Nursing representatives was set up to agree a project plan and identify project teams (Detailed above in project team). This is involved representations from Community Healthcare Organisations and national posts to ensure all key stakeholders were included. This was an inter disciplinary team including all grades of PHN services, a pharmacist, a GP, nurse prescriber, acute hospital representative, representative from cancer control programme, OMNSD representation. This ensured that all stakeholders were involved from the outset and each brought a unique viewpoint to the group.

SUSTAINING IMPROVEMENT

As part of the exploring and preparing stage of implementation sample existing medication management procedures in place in local CHO's were reviewed prior to preparing the first draft of this national procedure. This review assisted in identifying the existing barriers to safe practice in this area and the potential facilitator actions required for implementation.

On planning and resourcing consultation took place with the ICT and Healthlink teams re the current development of an electronic version of a primary care referral form (PHN services) and incorporating the medication request form into that electronic document. Existing channels of communication were utilised to inform all relevant staff of the request form and supporting documentation.

This approach ensured that all community nurses/GP's/acute hospitals understood and appreciated that the request form and associated procedure contributes to the effective and safe management of medication administration in the community nursing service.

APPENDIX 1

Medicines Request and Administration Record for Public Health Nursing Services



Medicines Request and Administration Record for Public Health Nursing Services

This is not a prescription

Patients Name		Name of Patients GP:				
Address	Attach Addressograph Label	Patient Aware of Referral: (tick) Yes <input type="checkbox"/> No <input type="checkbox"/>				
		DOB:				
		Patient Contact Tel No.:				
Drug Allergy: Yes <input type="checkbox"/> No <input type="checkbox"/> (if yes note type of allergy here)						
Current Medication: Yes <input type="checkbox"/> No <input type="checkbox"/> (if yes attach a current list to this request form)						
This form is not suitable for requesting sliding scale therapy/ drug cycles.						
Prescriber Request No. 1				Nurse Administration Record No 1		
Name of Drug (BLOCK LETTERS)		Date 00/00/00	Time 00:00hr	Signature	Print name	Reasons for non administration (use codes 1 – 6)
Indication		This section must be completed before commencing page 2 Administration Continuation sheet				
Dose (eg. 10mgs)						
Route (eg. IM)						
Time (eg. 14:00hrs)						
Frequency (eg. weekly)						
Start date						
Administer until (insert date)						
Additional information/ special instructions						
Prescriber's signature						
Prescriber's location/ hospital/ ward /phone no.						
Date						
Print Name						
Registration No.						
Each drug request is valid for a maximum period of 9 months only. If a medication is to continue beyond this period the prescriber must complete a new request form. A new form must be completed for each drug dose adjustment.						
Prescriber Request No. 2				Nurse Administration Record No 2		
Name of Drug (BLOCK LETTERS)		Date 00/00/00	Time 00:00hr	Signature	Print name	Reasons for non administration (use codes 1 – 6)
Indication		This section must be completed before commencing page 2 Administration Continuation sheet				
Dose (eg. 10mgs)						
Route (eg. IM)						
Time (eg. 14:00hrs)						
Frequency (eg. weekly)						
Start date						
Administer until (insert date)						
Additional Information						
Prescriber's signature						
Prescriber's location/ hospital/ ward						
Date						
Print Name						
Registration No.						
This form must be signed by the authorised prescriber. If any part of this request is unclear the medication should not be administered by the registered nurse/midwife and the prescriber must be contacted to rewrite the request. [HSE 2020 Procedure: Completion of the request form to the PHN service for Medication Administration]						

Reasons for non administration of medication: 1. Patient did not attend/not at home 2. Patient refused 3. Medication unavailable
4. Withheld as per Doctors Instructions 5. Awaiting clarification 6. Other

APPENDIX 2

Medicines Request and Administration Record for Public Health Nursing Services
Continuation Administration Record



Medicines Request and Administration Record for Public Health Nursing Services
Continuation Administration Record

[illegible]

Reasons for non administration of medication: 1. Patient did not attend/not at home 2. Patient refused 3. Medication unavailable
4. Withheld as per Doctors Instructions 5. Awaiting clarification 6. Other

ENTRY 12

QI PROJECT TITLE	Prostate Biopsy Infection Rates in the Mater Hospital Radiology Department.
PROJECT LEAD(S)	Dr Jack Power, Dr Carmel Cronin, Prof John Murray
PROJECT TEAM	Dr Carmel Cronin, Dr Barry Hutchinson, Dr Daragh Murphy, Mr Kieran O'Malley, Dr Margaret Hannan, Ms Catherine McGarvey (CNS), Ms Nisha Soman (CNS), Prof John Murray
ORGANISATION	Mater Misericordiae University Hospital, Dublin
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

OBJECTIVE

Transrectal prostate biopsy (TRPBx) is the most common method of prostate biopsy in Ireland and worldwide (Heidenreich, A. et al). Multiple studies have shown the increasing risk of post-procedural infection and sepsis (Rudzinski, JK. et al) related to TRPBx as a result of increasing antimicrobial drug resistance (Pilatz, A. et al).

Sepsis can be life threatening. A Swedish study of 50,000 patients undergoing TRPBx Sweden found a hospitalisation rate of >1% for sepsis and 34 patients died as a result (Lundstrom, KJ. et al).

As part of our ongoing QI, we perform an annual audit on post-procedural infections and sepsis. Looking at our own data, and global trends, we were concerned about this increasing risk and our goal was to find solutions to decrease this risk.

The standard we use for comparison is the Bennet et al systematic review and meta-analysis (2016). This is the most comprehensive review of TRPBx post-procedural infection rates, involving 162,577 patients. The review found a post TRPBx sepsis rate to be 0.8% which we used as our reference.

METHOD

In the calendar year of 2019, we performed 590 prostate biopsies via the transrectal route across both departments.

Post-procedural sepsis was defined as blood stream sepsis (blood culture confirmed) or clinical sepsis (clinical criteria for sepsis but no culture growth). Patients were followed up with a phone call from the clinical nurse specialist the day following the

procedure, followed by a later clinic review. All hospital admissions were recorded, including location and length of stay. The data was collected over the 12-month period.

In total there were 23 patients diagnosed with sepsis (8 blood culture confirmed, 15 clinically diagnosed), a rate of 0.04%. A further 9 patients were diagnosed with urinary tract infections requiring oral antibiotics. There was one case of acute urinary retention and one acute rectal bleed that required hospitalisation.

Of the patient's admitted with post-procedural sepsis, a total of 73 days was spent in hospital, with 2 admissions to HDU. We estimated the average 'bed cost' at €947 per day, costing the health service approximately €69,131. This figure does not include further costs such as laboratory investigations, radiological imaging, and IV antibiotics.

Although these rates were high, they were still within international norms. From January – September 2020, we performed a repeat audit across the two sites to ascertain whether our rates of post-procedural infection and sepsis were increasing.

We looked at 262 sequential TRPBx across the 2 centres in 2020. There were 10 cases of sepsis (3 blood stream diagnosed, 7 clinically diagnosed), with a further 3 cases of urinary tract infections. This is a 2.6% risk of sepsis in our population and shows a marked increase in risk.

Prompted by this worrying trend, we assessed the literature for ways to reduce this risk.

Sepsis can be markedly reduced by performing prostate biopsies through the perineum (TPPBx) rather than transrectal. This procedure was being performed in selected cases, but under general anaesthetic. A move to TPPBx has long been mooted as a means to reduce infection but performing all prostate biopsies in theatre under general anaesthetic is not practical. TPPBx under local anaesthetic is a new procedure that reduces costs and increases patient throughput.

Our department had radiologists competent in performing TPPBx under general anaesthetic. These radiologists were able to transition to TPPBx under local anaesthetic with some training and have since trained further radiologists to perform the procedure.

The Mater campus began performing TPPBx under local anaesthetic in April 2020 and transitioned completely from TRPBx in October 2020.

After implementing this change, we performed a repeat audit of our cases TPPBx performed to date. The same data was included; diagnosis of sepsis, hospital admission, length and location of stay.

FINDINGS/RESULTS OF THE QI PROJECT

In this repeat audit, we had 2 standards for comparison: our data from TRPBx performed the same year, and international data suggesting the virtual elimination of post procedural sepsis with TPPBx (Szabo, R.J. et al, 2020).

From our start in April, there have been no cases of post procedural sepsis out of 302 patients. Further to this, there have been no cases of urinary retention or significant rectal bleeds requiring hospitalisation.

Using the chi-squared test to compare the two sets of data, we found them to be statistically significant (Yates' P value = 0.0006).

This audit of our early with TRPBx biopsy is very encouraging. It is in line with best international data with the elimination of post-procedural sepsis.

DETAILS OF STAKEHOLDER ENGAGEMENT

We have engaged with key stakeholders throughout the process. Urology and radiology have worked in tandem throughout this project, with both departments fully engaged. A second specialised ultrasound probe has been ordered to enable us to increase patient throughput. Teaching sessions have been held for the radiology registrars and nursing staff to bring everybody up to speed with this new procedure.

SUSTAINING IMPROVEMENT

The next step for our QI improvement is patient feedback. TPPBx under local anaesthetic has been shown to have comparable patient tolerability when compared to TRPBx (Stefanova, V. et al). We have formed a patient questionnaire relating to their experience of the procedure and this is ongoing. We have seen very encouraging results from a clinical perspective, and now we want to survey patients to see if we can make further improvements to the patient journey.

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ENTRY 13

QI PROJECT TITLE	Reducing Hospital Acquired Pressure Ulcers using Plan, Do, Study, Act (PDSA) Quality Cycle
PROJECT LEAD(S)	Emma Cullen Gill, Tissue Viability Clinical Nurse Specialist
ORGANISATION	Clontarf Hospital
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

INTRODUCTION

Clontarf Orthopaedic Hospital is a 160 bedded rehabilitation hospital caring for patients with a multitude of rehabilitation needs such as orthopaedic, neurological and frail, older patients. A Tissue Viability Clinical Nurse Specialist 0.5 FTE position was filled and employment commenced in February 2020.

OBJECTIVE

The objective of the QI project was to reduce hospital acquired pressure ulcers. The TVN used the Quality Improvement cycle of Plan, Do, Study, Act to achieve this goal.

PLAN

- improve nursing staff education and knowledge of pressure ulcer prevention, grading and documentation
- correct and timely risk assessment of the patient
- awareness of frequent patient offloading/relieving pressure.

PRESSURE ULCERS

A pressure ulcer is localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear (HSE, 2018). Patients with pressure ulcers experience anger, depression, and social isolation due to the pain of dressing changes, odour of wound drainage, and the physical limitations placed on them in order to adhere to treatment (Gorecki et al., 2009). According to Greenwood and McGinnis (2016), analysis of why patients develop pressure ulcers in healthcare settings regularly suggests lack of education for staff to be a key factor. High incidences of pressure ulcers in an institution may imply a diminished quality of care (Gallagher et al., 2008).

PRESSURE ULCER STATISTICS

The Tissue Viability Nurse (TVN) monitors, audits and documents all Hospital Acquired Pressure Ulcers (HAPU) via the Pressure Ulcer to Zero and National Information Management System (NIMS), on a monthly basis. The NIMS is forwarded to the Risk Department and Director of Nursing for further analysis which is then collated and sent to the Health Service Executive (HSE).

In Quarter 1, 2020 Hospital Acquired Pressure Ulcers = 9.

Incidence rate = 2.4%

Month	Sacral	Heel	Elbow	Total
January	1	2	1	4
February	3	2	0	5
March	0	0	0	0
Total	4	4	1	9

Figure A: Breakdown of HAPU anatomical regions Q1 2020

DO: DETAILS OF CHANGES IMPLEMENTED

- Visible presence of the TVN on all wards, taking referrals, reviewing patients, assessing wounds discussing wound care plan and giving expert advice. The TVN aims to empower nursing staff and offer guidance and support through clinical practice.
- Hospital Pressure Ulcer policy and SSKIN Bundle was updated and uploaded onto the public share drive system.
- A one hourly educational programme on Pressure Ulcer Prevention and Management was organized by the TVN, targeting nursing staff and Health Care Assistants This also involved a collaboration with Occupational Therapy (OT) department. Due to its success, it was extended to include Health and Social Care Professionals.
- Collection of monthly pressure ulcer statistics and observing trends was maintained. Meeting with nurse managers for root cause analysis if any HAPU's notified in monthly report. Writing up and disseminating quarterly reports to key stake holders, which included, quality, risk and senior nursing departments.
- Monitoring audit/ metrics of SSKIN Bundle and Pressure Ulcer prevention care plans. Following up on results with appropriate action plans to key stakeholders which included nursing, audit team and quality department.
- Offloading heel cushions were purchased and distributed to all clinical areas.
- Rental air mattresses are audited on a weekly basis, ensuring 'at risk' patients are appropriately nursed on them

- A #stopthepressure stand was organised to highlight Pressure Ulcer awareness day on November 19th. This proved a very successful, enjoyable day with high input from all staff. https://www.epuap.org/wp-content/uploads/2020/11/clontarf-orthopaedic-hospital-stopthe-pressure_nov2020.pdf
- Rental air mattresses are audited on a weekly basis, ensuring 'at risk' patients were appropriately nursed on them
- A #stopthepressure stand was organised to highlight Pressure Ulcer awareness day on November 19th. This proved a very successful, enjoyable day with high input from all staff. https://www.epuap.org/wp-content/uploads/2020/11/clontarf-orthopaedic-hospital-stopthe-pressure_nov2020.pdf
- Wound Link nurses were recruited from each ward with details of roles and responsibilities. The first meeting was held on Nov 19th and was well attended. Further meetings are planned for 2021.
- Wound dressings were evaluated by the TVN and wound link nurses resulting in 2 dressings being discontinued and another dressing item swapped out. This has added quality to patient care and reduced cost to the hospital.

STUDY – THE RESULTS OF THE QI PROJECT

Q2, Q3 and Q4 showed a steady decrease of HAPU's despite the Covid 19 pandemic occurring in the hospital at that time (Figure B).

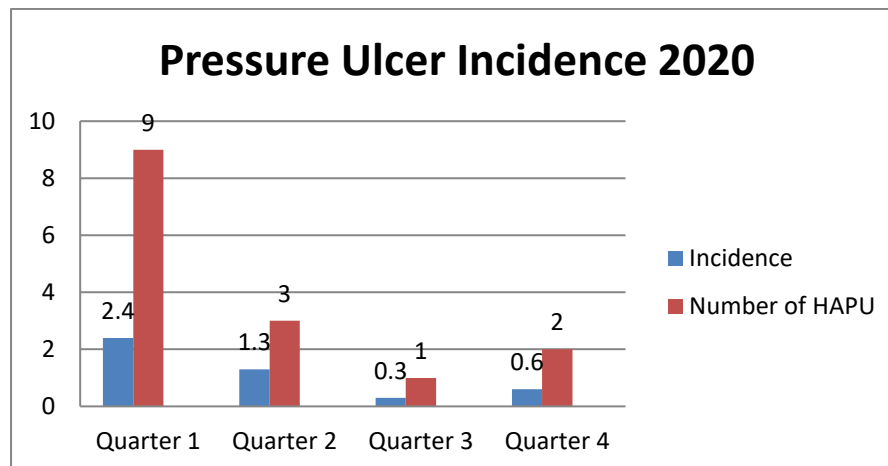


Figure B

Total HAPU's for 2019 =36. Incidence rate =2.8%
Total HAPU's for 2020 = 15. Incidence rate =1.2%
HAPU's from 2019 to 2020 were reduced by over 50% (Figure C).

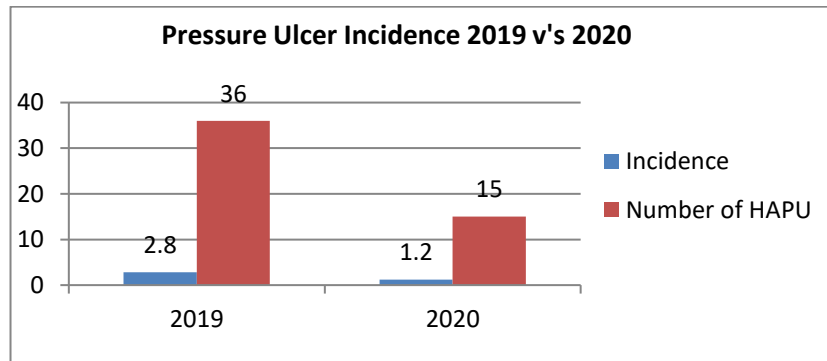


Figure C

ACT: TO MAINTAIN AND SUSTAIN

- TVN CNS continues to monitor monthly Pressure Ulcer to Zero and monthly NIMS forms, and feedbacks to Nursing, Risk, Quality and Senior Executive Teams.
- Ongoing Pressure Ulcer prevention education will be arranged for staff for 2021.
- Ongoing meetings with wound link nurses for 2021
- Preventing HAPU's will remain an ongoing concern for ALL staff

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ENTRY 14

QI PROJECT TITLE	"Striking Back Against Stroke" Connolly Hospital Strikes FAST Again
PROJECT LEAD(S)	Lisa Donaghy (Stroke CNS)
PROJECT TEAM	Laura Morrison (SPR MFTE), Julie Prendergast (CSR CT), Dr. Eamon Dolan (MFTE Consultant), Dr. Marie O'Connor (MFTE Consultant), Dr. Avril Beirne (MFTE Consultant), Dr. Patricia Guilfoyle (MFTE Consultant)
ORGANISATION	Connolly Hospital Blanchardstown
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND AND RATIONALE

Approximately 10,000 Irish people have a Stroke each year, and 80 million globally. 116 million years of healthy life is lost worldwide to Stroke related disability annually. Ireland's Stroke rate is estimated to increase by 59% by 2035. 2 million brain cells die every minute in Stroke, increasing the risk of permanent brain damage, disability and/or death.

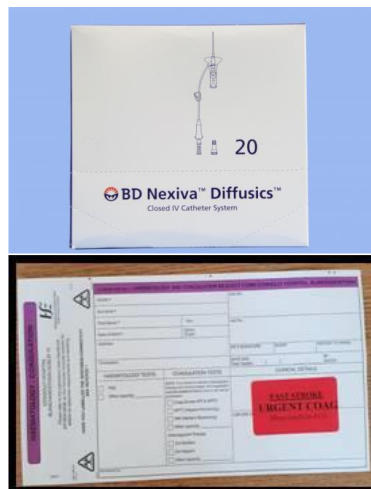
The Stroke Service in Connolly Hospital was re-developed in July 2017 with the appointment of a Stroke CNS in September 2017. The over 65 years of age population is reported to increase by 40% by 2030 in the Connolly Hospital catchment area (CHO Dublin North City & County into Meath and North Kildare).

Due to the aging population, the predicted Stroke increase and the importance of time in treating Stroke, The Stroke CNS (Lisa Donaghy) initiated a Quality Improvement Project (QIP) to reduce the assessment and treatment times of Acute Stroke patients in Connolly Hospital Blanchardstown. The aim of the project was to reduce door to decision time for Thrombectomy to less than 30 minutes in conjunction with the National Thrombectomy Quality Improvement Programme.

An audit of baseline times was conducted prior to any changes. A Stroke Steering Committee was set up consisting of a wider group of Stakeholders involved in FAST positive calls, consisting of a representative from Ambulance, Clerical, Emergency Department (Medical & Nursing), Radiology, Laboratory, Patient Flow and Quality & Safety Officer. The current FAST call process was mapped out consisting of each step involved from patient arrival to decision of treatment time. Following this, areas of delays were identified and changes were implemented to improve times.

Current delays and areas for change:

1. Pre-alert by ambulance – 30% of FAST calls were pre-alerted prior to the QIP. The Stroke CNS educated ambulance teams on assessing Stroke and importance of alerting the Emergency Department. Monthly audit feedback provided to the Ambulance teams. Pre-alert cases improved to 80% following this.
2. Alerting the Stroke Team - Audit of patient arrival to Stroke Team contact conducted. Educated the Medical and Nursing team in ED.
3. Registration - Ward clerk in attendance prior to ED arrival
4. IVC *Nexiva Diffusics - Suitable for all flow rates.
5. Urgent INR - Red "FAST STROKE" labels for bloods. Education with laboratory staff and ED staff. Urgent INR now obtained within 7 minutes compared to 22 minutes on average prior to the QIP.
6. Equipment for transfer - No cardiac monitoring if patient is stable.



RESULTS

Median times of 108 patients who were FAST calls were analysed:

No.	KPI	Pre-QI (Sept '18)	Post-QI (Sep '19)	Total Time Reduced
1.	Door to CT	37 mins	22 mins	↓ 15mins
2.	Door to CTA	35 mins	25 mins	↓ 10mins
3.	Door to lysis	65 mins	24 mins	↓ 41mins
4.	CTA to time of contact Beaumont	30 mins	11 mins	↓ 19mins
5.	Door to decision re: Thombectomy or not	166 mins	23 mins	↓ 143mins

***** TOTAL NEURONS SAVED = 286 MILLION *****

CONCLUSION

This is an ongoing process which continues to ultimately improve patient outcomes by accurately assessing and identifying a stroke, thus delivering prompt treatment resulting in lesser disability and reduced hospital length of stay.

"Time is Brain" - EVERY SECOND COUNTS IN STROKE!

ENTRY 15

QI PROJECT TITLE	UHW OA Knee Pathway
PROJECT LEAD	Siobhan Corcoran
PROJECT TEAM	Professor May Cleary, Mr. Terence Murphy (Orthopaedic Dept, UHW), Damian Rice (Physiotherapy Manager, Wexford), Pauline Kirwan (Physiotherapy manager, Waterford), Anne-Marie Tully (Dietetics Manager, South East Community Healthcare)
ORGANISATIONS	UHW Orthopaedic Dept, South East Community Healthcare Physiotherapy, South East Community Healthcare Dietetics.
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

BACKGROUND

The Musculoskeletal Triage Physiotherapy (MSK) model has shown the positive impact that non-consultant health professionals can have on both Orthopaedic and Rheumatology waiting lists. An audit of the MSK Triage Orthopaedic service in University Hospital Waterford (UHW) demonstrated that 75% of patients with knee osteoarthritis (OA) assessed within the MSK Triage service did not require specific Orthopaedic intervention and were managed using a conservative treatment pathway. In an already over-burdened elective Orthopaedic service with escalating wait times, this poses the question – should these patients have been referred in the first instance?

OBJECTIVE

The aim of the UHW OA Knee Pathway is to create a more efficient channel into elective Orthopaedics for patients who are more likely to need surgical intervention whilst providing local, community-based care for those with non-surgical needs.

The objectives of the project include:

- Development of a framework for the UHW OA Knee Pathway
- Establishment of a dedicated community-based physiotherapy and dietetic service in both Waterford and Wexford
- Implementation of a Rapid Access Knee Clinic in UHW elective Orthopaedic clinics

The UHW OA Knee Pathway, once fully operational, can be further expanded regionally and with time nationally where sites have access to MSK Triage

physiotherapists. It will facilitate a shift from Orthopaedics to Primary Care physiotherapy and dietetics as the first point in the referral pathway for patients with knee OA. This will reduce the rate of referrals into Orthopaedics, ensure a higher conversion-to-surgery rate from out-patient (OPD) consultations and facilitate a reduction in the global orthopaedic OPD waiting list.

FINDINGS/RESULTS

The UHW OA Knee Pathway received Slaintecare funding to undertake this project and has been officially operational for 3 months to date.

Over 243 patients with knee OA have been removed from physiotherapy waiting lists in Waterford and Wexford since commencement of this project with wait time for care steadily improving.

Over 141 patients with knee OA have been offered dietetic appointments to date with a 30% uptake. 18kg in weight loss has been achieved by patients specifically targeting weight loss in the past 3 months. Patients are also benefiting from dietetic input for Crohn's Disease, Reflux and general healthy eating advice.

5 patients have successfully received intervention in the Rapid Access Knee Clinic, all within 4 weeks of referral. The UHW OA Knee Pathway can facilitate up to 5 times quicker access to Orthopaedic intervention than the traditional model of care.

An automated database has been created for use in community-based physiotherapy and dietetics where clinicians have less access to patient management systems and administrative support. The database generates automated appointment and discharge letters along with real-time statistics, facilitating maximum clinician time with direct patient care.

DETAILS OF CHANGES IMPLEMENTED

A dedicated community-based physiotherapy service has been established in both Waterford and Wexford. This service offers an adaptable, blended therapy model including in-person and telehealth individual and group intervention. The model of care has evolved to respond quickly to COVID-19 and the varied levels of restrictions.

The appointment of a community-based dietitian in Waterford and Wexford provides a service previously not available to this cohort of patients. Obesity continues to be a significant barrier in the management of knee OA and access to a dietitian can help with surgery avoidance or pre-op improved nutritional status. Consultations are currently offered via telephone and the dietitian also provides a pre-recorded educational talk as part of the physiotherapy-led knee classes.

A Rapid Access Knee Clinic has been established in UHW elective Orthopaedic OPD clinics. Patients who attend community-based physiotherapy and who are identified as requiring further Orthopaedic opinion and intervention can be referred to the Rapid Access Knee Clinic. This clinic, jointly run by the MSK Triage physiotherapist and Orthopaedic consultant, facilitates same day injection or listing for surgery for patients depending on their requirements.

STAKEHOLDER ENGAGEMENT

Extensive GP engagement was sought prior to the roll-out of this project. The unanimous feedback from GPs was the need for quicker access to community physiotherapy in order for them to refer less knee OA patients to elective Orthopaedics. As a result of this engagement creating a more efficient and accessible community physiotherapy service has been the cornerstone of UHW Knee OA Pathway.

Patient feedback was sought in relation to in-person physiotherapy-led knee classes which was the original model of care prior to the COVID-19 outbreak and official project commencement. Although these classes have very high satisfaction levels, some patients reported that they would prefer some individual input. Based on this feedback all patients now receive an individual initial appointment prior to starting the knee class programme.

SUSTAINING IMPROVEMENT

The appointment of dedicated community-based physiotherapy posts is essential in the long-term success of managing chronic MSK conditions such as knee OA at local, community level. With many Primary Care regions struggling to provide any service for this cohort of patients, protected roles such as those within the UHW OA Knee Pathway are invaluable and have a significant wider healthcare impact on Orthopaedic referral rates, wait times and conversion-to-surgery rates within Orthopaedic OPD clinics.

Obesity and mal-nutrition are an ever-increasing challenge within elective Orthopaedic services. Many patients' weight problems significantly worsen while they wait for an Orthopaedic consultation, with their care plan more complicated as a result. A dedicated dietetic service offered sooner at local, community level will help these patients to address their dietary needs at an earlier stage. This can help with surgery avoidance or a more straight-forward care plan should they require intervention.

The establishment of the Rapid Access Knee Clinic ensures that patients with the most urgent and appropriate needs are prioritized for an Orthopaedic consultation. Criteria for referral includes symptom severity scales, patient desire for intervention and completion of a comprehensive course of conservative care. This will encourage both GPs and community physiotherapists to adopt a different referral approach to Orthopaedics going forwards.

The efficiency of the automated database has helped to sustain an improvement in direct clinician-patient contact time. Furthermore the database can be accessed remotely so clinicians working from different sites can utilize any available down-time to keep on top of administration duties.

ENTRY 16

QI PROJECT TITLE	Utilisation of Lean Six Sigma Tools for Quality Improvement in Interventional Radiology
PROJECT LEAD	James W Ryan, Sine Gilchrist, Leo P Lawler.
PROJECT TEAM	Sean Paul Teeling, Anita Little, Mark Glynn, Lisa Comerford, Megan Power-Foley, Tony Geoghegan, John G Murray.
ORGANISATION	Mater Misericordiae University Hospital Radiology Directorate.
CLINICAL AUDIT TYPE	Local <input checked="" type="checkbox"/> National <input type="checkbox"/>

CONTEXT

This project took place in a tertiary referral, inner-city, university hospital which provides a diverse range of IR procedures including genitourinary, hepatobiliary, vascular, and oncological interventions. Our IR suite contains 2 procedure rooms where Ultrasound and fluoroscopy are utilized to diagnose and treat patients. Our daily staff complement usually includes; an IR consultant, IR fellow, 3 radiographers, 2 nurses and an intern.

DEFINE

A project team was assembled including; a senior IR consultant, a senior IR radiographer, an IR fellow and an assistant professor in health systems. The project aims and scope were defined in the project charter which was critically analysed to ensure that goals were specific, measurable, achievable, realistic and timebound (SMART analysis). The following were within project scope; Inpatient referrals, outpatient/elective referrals, procedures commenced during standard working hours (8 am-5 pm, Monday-Friday). The following were out of scope; IR procedures performed outside standard working hours, CT procedures and barium studies. Musculoskeletal and Hysterosalpingogram procedures do not require complex patient-prep and were not subject to delays in the pilot project and were thus excluded. A patient-prep process map was created (Fig. 1 overleaf), which allowed for detailed process analysis and helped to formulate interventions [9].

STAKEHOLDER ENGAGEMENT

We defined a stakeholder as a person who may be affected by or has influence over the project but who is not directly involved in doing project work. The role of stakeholders in LSS interventions and the impact of process improvement on staff experience and patient outcomes has previously been described [10–12].

A Power-Interest Grid Stakeholder Analysis was performed to identify influential groups and individuals who were important to project success (Fig. 2) [9]. Stakeholders were informed of the project aims early on and were updated as the project progressed.

IR Patient-Prep Process Map

Pre-intervention

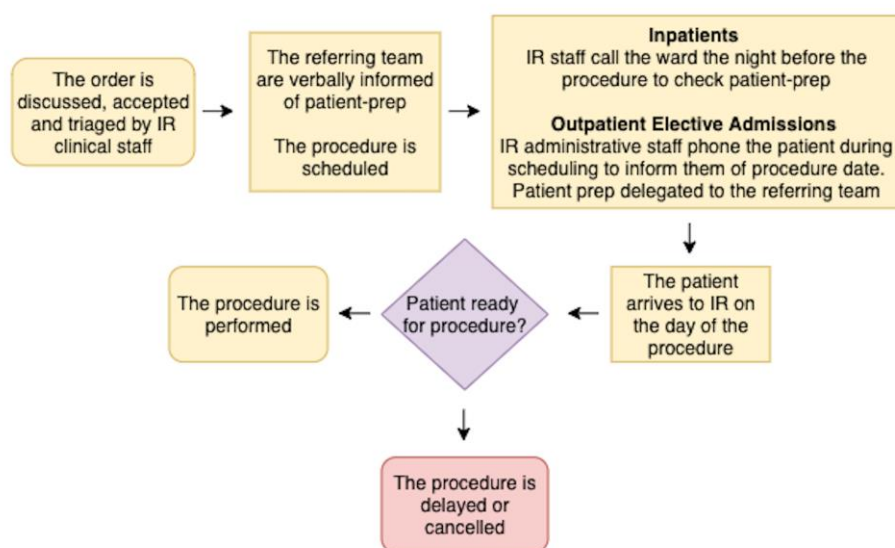


Figure 1: Patient-prep process map pre-intervention

Power Interest Grid for Stakeholder analysis

Stakeholders:

1. Interventional Radiology Attendings
2. Referring Clinical Teams
3. Ward Nurses
4. Radiology Clinical Director
5. IR Radiology Residents
6. IR Technologists
7. IR Nurses
8. IR Administrative Staff
9. Porters
10. Director of Nursing

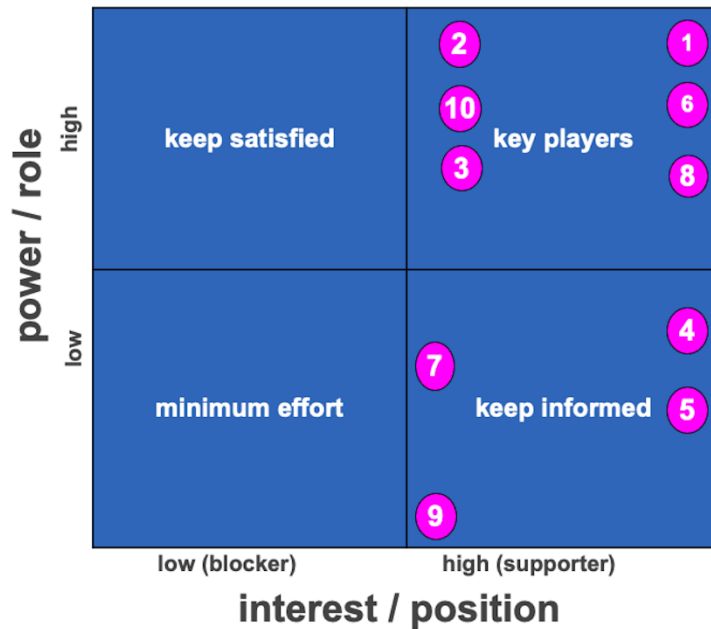


Figure 2: Power-Interest Grid: Stakeholder Analysis

A Critical to Quality (CTQ) analysis was performed to identify performance metrics to quantify the effect of interventions (Table. 1) [9]

CTQ Analysis Summary

Customers	Need	Drivers	Metrics
Patient	Diagnostic & interventional procedures performed safely and in a timely manner	Safe and efficient procedure turnover	Patient-prep rates, IR throughput, room downtime due to non-prep
IR Staff	Adequately prepped patients	Correct pre-procedural patient-prep from ward staff and referring teams	Patient-prep rates, room downtime due to non-prep
Referring Teams & Wards	Information on how to prep patients for IR procedure	Efficient communication between IR and referrers	Patient-prep rates
Radiology Department	To minimize room downtime and promote efficient use of staff & resources	Correct pre-procedural patient-prep from ward staff and referring teams	Patient-prep rates, IR throughput, room downtime due to non-prep
Hospital	Appropriate use of beds and resources	Correct pre-procedural patient-prep from ward staff and referring teams	Inappropriate bed occupancy time and cost due to non-prep for elective admissions, IR throughput

Figure 3: CTQ Analysis Summary

MEASURE

A diverse set of outcomes (prep rates, room downtime, throughput, bed occupancy time and cost due to non-prep) were measured before, during and after intervention. Patient-prep data were collected prospectively for each patient by a radiographer before commencing the procedure. The pilot project helped identify common prep issues and familiarized radiographers with the data collection process.

Practical issues encountered and queries arising from the pilot project were addressed at a post-pilot meeting. A standardised patient-prep data collection template was created after review of pilot project data and was subsequently used in the main project. The patient's ward, referring physician, prep status, the reason for non-prep, and room downtime due by non-prep were recorded for each case. The template consisted of a check-box, yes-no, format with free text portions to record time delays and any relevant additional information (see appendix). Patient-prep data were reviewed, checked for completeness and digitally recorded on a spreadsheet by the project team at the end of every week.

Some elective admissions had prolonged overnight/multi-day hospital stays due to non-prep. These cases were identified and recorded by reviewing the electronic patient record (EPR). Estimated bed occupancy time due to non-prep in such cases was calculated as follows; non-prepped patient's bed occupancy time - average prepped patient bed occupancy time (varies for different procedures) = length of stay attributable to non-prep. Elective IR admissions remaining in hospital for issues other than non-prep were excluded from this analysis e.g. incidentally noted iron deficiency anaemia requiring work-up.

Pre-intervention patient-prep data collection was carried out prospectively over 4 weeks in August 2019 (132 patients). Interventions commenced in January 2020. Peri/Post-intervention patient-prep data were collected from January-August 2020 (1113 patients). Data collection was incorporated into the pre-procedure timeout. Data were reviewed and Pareto charts constructed to display reasons for non-prep and prep-rates amongst patients from various referring teams and wards. This facilitated identification of those most in need of intervention. Fig. 3 illustrates the reasons for non-prep amongst inpatients pre-intervention.

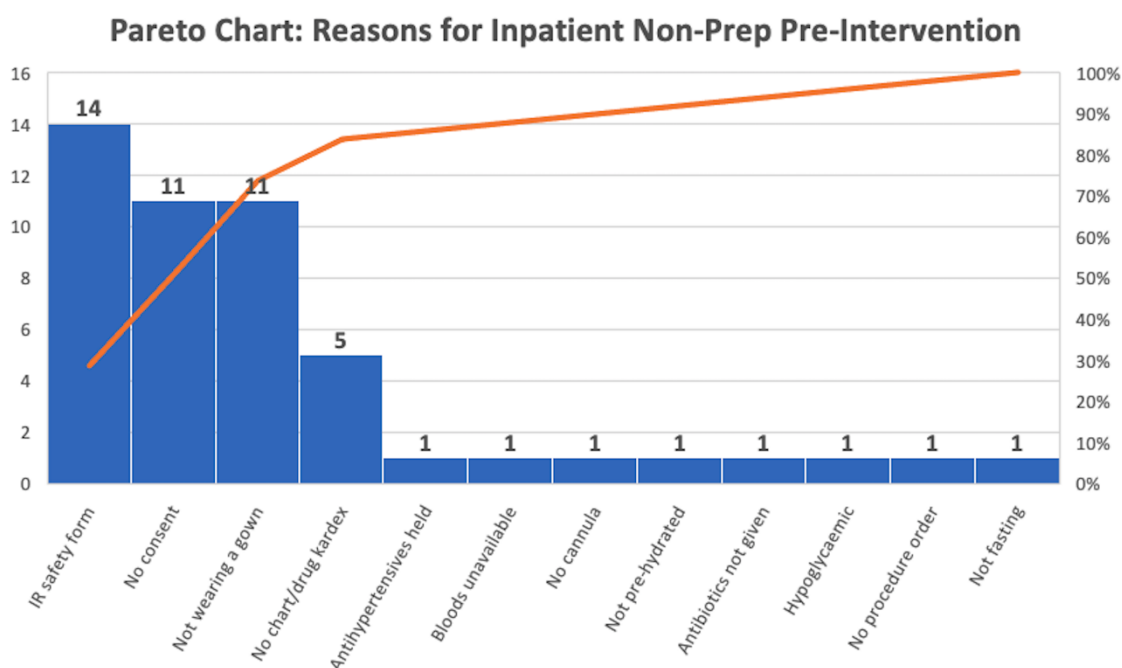


Figure 4. Pareto Chart: Reasons for Inpatient Non-Prep Pre-Intervention

Throughput was assessed using time series data sampling from the EPR. Post-intervention throughput data was taken from the 1st 10-weeks of 2020 (50 weekdays), restrictions due to the COVID-19 pandemic prevented a larger throughput sample. Pre-intervention throughput data were taken from the same 10-week period over the past 5-years, 2015-2019 (250 weekdays). Duplicate orders were excluded.

ANALYSE

Normality testing was used to guide appropriate statistical analysis which was carried out on GraphPad Prism software version 8.4.2 for Mac OS X. Patient-prep rates and room downtime due to non-prep per day were calculated for the pre and post-intervention periods (Fig. 6&7).

The pre-intervention data set included 132 patients over 19 days in August 2019. The peri-intervention data set included 158 patients over 22 days in January 2020. The post-intervention dataset included 145 patients over 20 days in February 2020, 146 patients over 21 days in March 2020, 99 patients over 21 days in April 2020, 127 patients over 20 days in May 2020, 143 patients over 21 days in June 2020, 156 patients over 23 days in July 2020 and 139 patients over 20 days in August. Patient-Prep and room downtime data sets failed the D'Agostino & Pearson normality test and were compared using the Mann-Whitney test.

Bed occupancy time due to non-prep in elective admissions was calculated for each month. For each patient, non-prep bed occupancy time was multiplied by the daily cost of an individual hospital bed (\$1132) to yield an estimated cost (Fig.8).

Peripherally inserted central venous catheters (PICCs) are the most common IR procedure performed at our institution. PICC throughput data sets failed the D'Agostino & Pearson normality test and were compared using the Mann-Whitney test (Fig. 9). Total IR throughput data passed the D'Agostino & Pearson normality test and were compared using a two-tailed, unpaired t-test (Fig. 10).

IMPROVE

Interventions commenced at the beginning of January 2020 (Fig. 5). A patient-prep checklist was created by the project team which included a list of common prep issues encountered during pre-intervention data collection (see appendix). This checklist was used in a daily inpatient-prep ward round where patients scheduled for the following day were reviewed, prep-issues identified and communicated to appropriate clinical staff.

IR administrative staff began making phone calls to elective patients the night before admission. During these calls, a prep-checklist was completed. Prep issues identified during phone calls were communicated to IR clinical staff.

Non-prepped patients identified on the ward round and pre-admission phone call were rescheduled. Senior IR radiographers and IR nurses carried out educational visits to the wards where copies of the prep-checklist were distributed. A senior IR consultant organised meetings with referring teams where IR prep data was presented and discussed. Wards and referring teams were prioritised for intervention based on Pareto analysis (those most likely to have non-prepped patients).

IR Patient-Prep Process Map

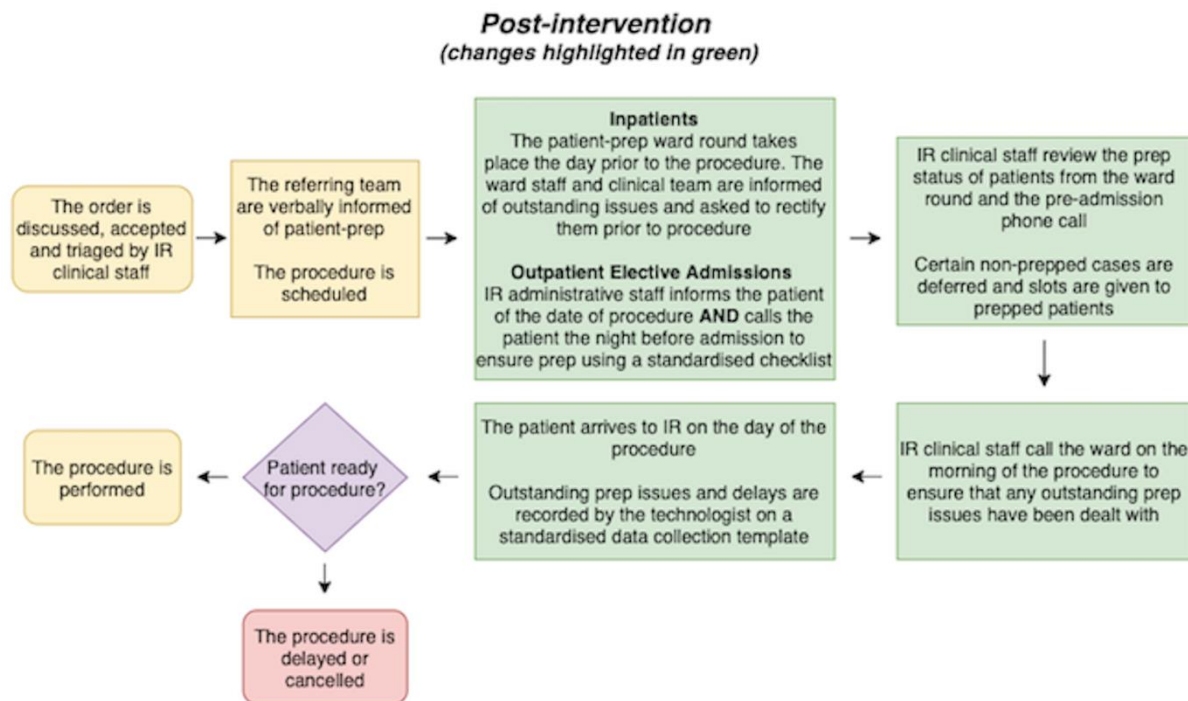


Figure 5: Patient-prep process map post-intervention

SUSTAINING IMPROVEMENT

A multidisciplinary IR process improvement committee was established in January 2020, the committee meets twice a month and includes senior IR consultants, radiographers, nurses, porters, administrative staff, an assistant professor in health systems and the head of the radiology department. The goal of the committee is to monitor and sustain process improvements through iterative data review, intervening when necessary. To date, the committee has performed several adjunct interventions:

- Writing and approving a standard operating procedure document for radiographer and nurse-led IR-prep ward rounds
- Drafting and distributing an IR-prep manual containing procedure-specific prep information for referring teams
- Implementing a standardized policy for out-of-hospital transfers to IR to help ensure adequate prep for such patients
- Approving the use of an encrypted smartphone instant messaging application to help improve communication between referring physicians and IR clinical staff. This app was accessed on a pre-existing hospital-wide subscription and did not incur any cost to the radiology department.

ETHICAL CONSIDERATIONS

This QI project was reviewed by the local Clinical Audit & Effectiveness Committee and has been approved for publication and presentation.

FORMAT

We referred to the proposed Standards for Quality Improvement Reporting Excellence guidelines when writing this project summary [13].

FINDINGS/RESULTS

Pre-intervention (19 days, 132 patients), the most common reasons for non-prep were incomplete IR safety form (n=44), absent consent (n=17), and patient not wearing a gown (n=15). Failure of the referring team to fill in the IR safety form was a time-consuming issue pre-intervention. It required contacting the referring team to complete the form whilst the patient was waiting in IR. Post-intervention (168 days, 1113 patients), patient not wearing a gown (n=59), absent drug Kardex/patient chart (n=35) and absent consent (n = 33) were the most common reasons for non-prep. Prep issues encountered post-intervention were generally less time consuming to deal with as well as being less frequent (Fig. 6).

Statistically significant improvements in patient-prep rates (Fig. 6) and IR room downtime due to non-prep (Fig. 7) were observed for each month post-intervention. Decreased variability in process outcomes was also observed, particularly in room downtime (Fig 6&7, Table 1). April 2020 was the only post-intervention month where increased variability in prep rates was observed relative to baseline data (Table 1a). This was due to a single day where prep issues were noted with all patients (100% non-prep).

Patient-prep Rates (1a) and Room Downtime due to Non-Prep (1b): Descriptive Statistics									
Table 1a									
Units used to measure patient-prep: Non-prep rate/day									
	Aug 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	June 2020	July 2020	Aug 2020
Number of days	19	22	20	21	21	20	21	23	20
Median (95% Confidence Interval)	0.75 (0.5-0.86)	0.17 (0.11-0.29)	0.21 (0.14-0.33)	0.25 (0.15-0.33)	0 (0-0.25)	0.13 (0-0.25)	0.17 (0.1-0.25)	0.13 (0-0.14)	0.14 (0-0.17)
Interquartile Range	0.5-0.86	0.08-0.29	0.13-0.41	0.12-0.39	0-0.27	0-0.25	0.05-0.25	0-0.2	0-0.19
Range	0.75	0.44	0.57	0.67	1	0.67	0.29	0.67	0.33
Table 1b									
Units used to measure room downtime due to non-prep: Average room downtime/patient/day									
	Aug 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	June 2020	July 2020	Aug 2020
Number of days	19	22	20	21	21	20	21	23	20
Median (95% Confidence Interval)	5.71 (1.11-10)	0.83 (0-2.5)	1.55 (1-2.78)	1.15 (0-3.33)	0 (0-1.43)	0.31 (0-0.83)	1.1 (0-1.67)	0.43 (0-1.5)	0.71 (0-1.43)
Interquartile Range	1.11-10	0-2.59	0.78-2.84	0-3.33	0-1.6	0-1.28	0-1.67	0-1.88	0-1.43
Range	32	10	15	10	5	3.33	5	5.67	7.5

Table 1: Patient-prep Rates and Room Downtime due to Non-Prep: Descriptive Statistics

IR Patient Non-Prep Analysis

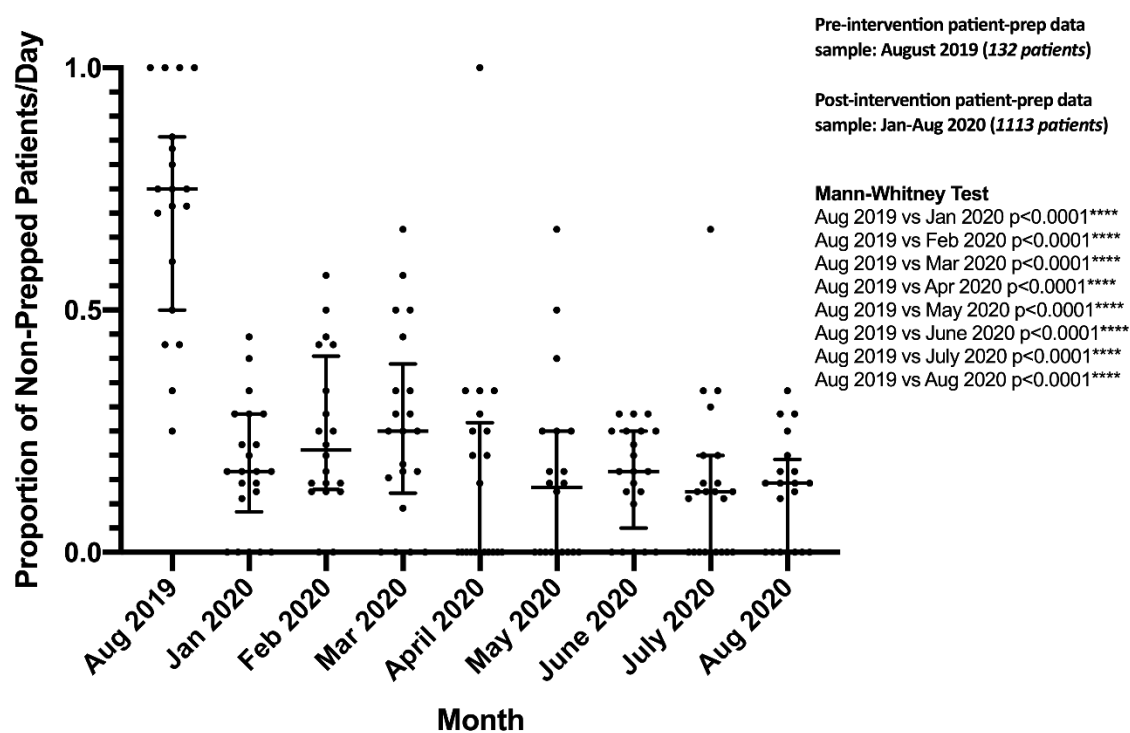


Figure 6: Frequency Distribution Curve for Non-Prep: Pre and Post-Intervention

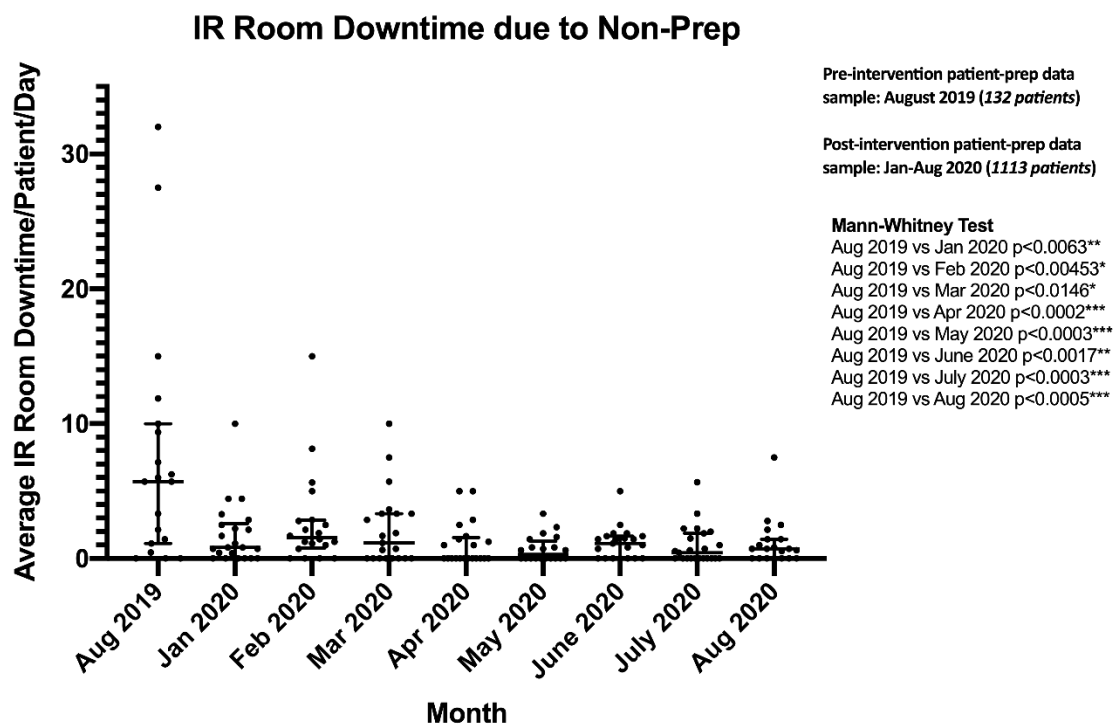


Figure 7. IR Room Downtime due to Non-Prep

Non-prep amongst elective admissions led to 19.1 days of overnight/multi-day bed occupancy and cost the hospital an estimated \$21,621 during August 2019. Post-intervention, no such bed occupancy has been identified amongst elective IR admissions to date (Fig. 8).

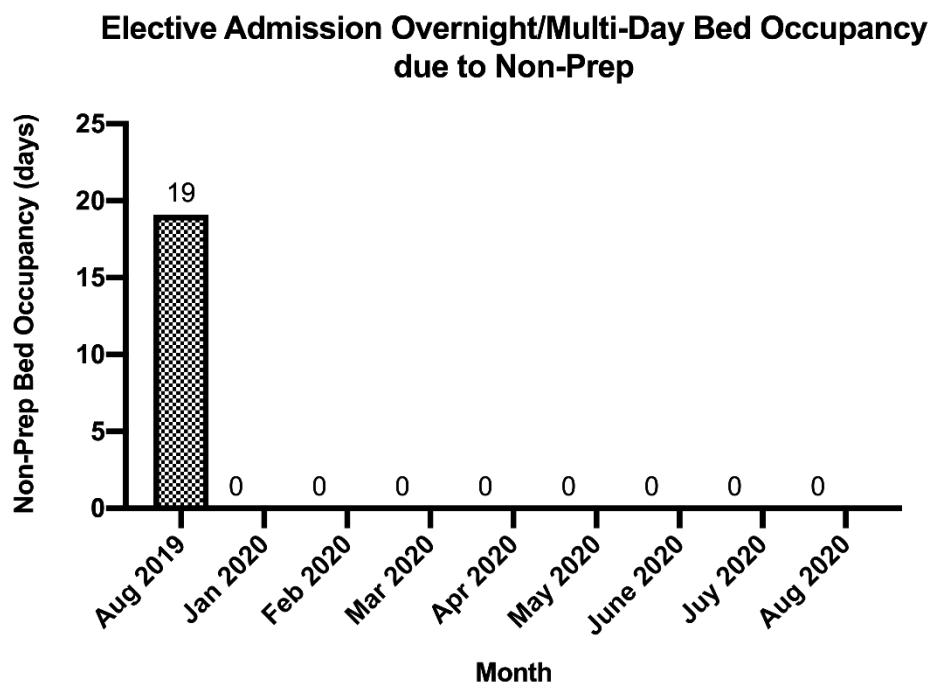


Figure 8. Elective Admission Overnight/Multi-Day Bed Occupancy due to Non-Prep

PICC throughput increased significantly post intervention (n=50 days) relative to cumulative data from the past 5-years (n=250 days). Median PICC throughput improved from 2 per day (95% CI 2-2) to 3 per day (95% CI 2-3) post-intervention ($p = 0.0058^{**}$) (Fig. 9).

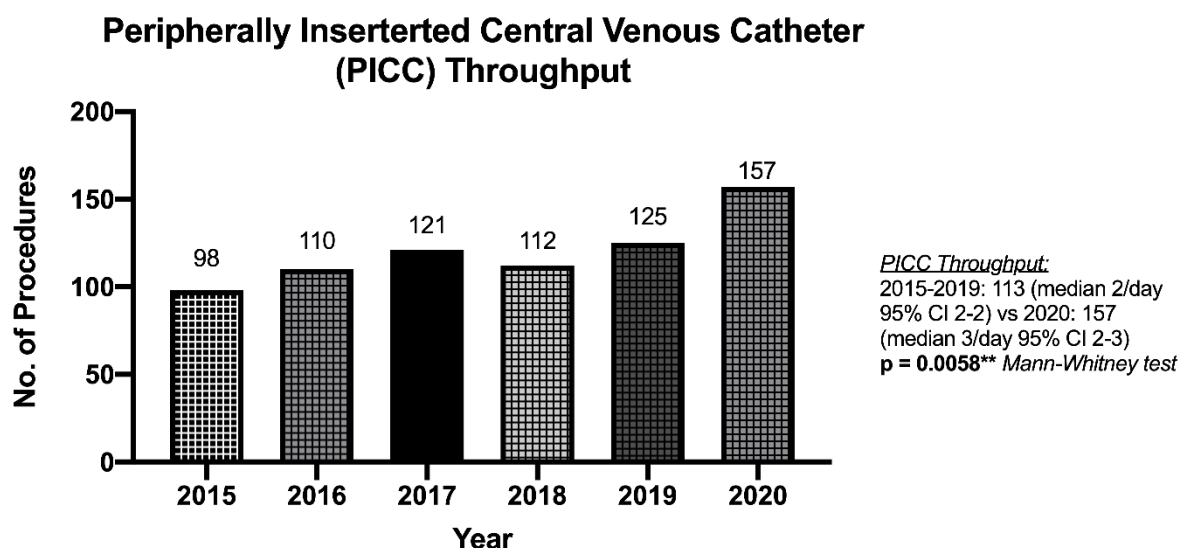


Figure 9. PICC throughput data pre and post-intervention

Mean throughput increased by 10% from 7.2 procedures per day to 8 procedures per day ($p=0.0143^{*}$, 95% CI: 0.16-1.44) relative to mean cumulative throughput from the past 5-years (Fig. 10).

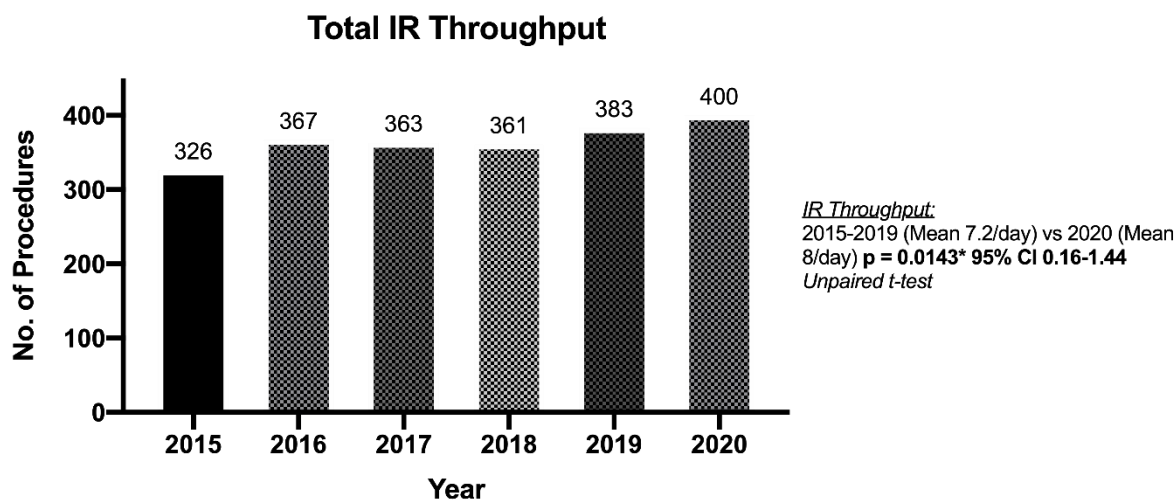


Figure 10. Total IR throughput pre and post-intervention

DISCUSSION

We used Lean-Six Sigma tools to improve our IR patient-prep process and quantified the impact of interventions using prospective multiparameter data collection and appropriate statistical analysis. A sustained and statistically significant improvement was observed in patient-prep and room downtime due to non-prep in the 8-months post-intervention. Interventions coincided with decreased variability in process outcomes as well as a statistically significant 33% increase in PICC throughout and a 10% increase in total IR throughput relative to cumulative data samples from the past 5-years. Improved identification of non-prepped elective patients pre-admission eliminated inappropriate bed occupancy due to non-prep. 19.1 days of such bed occupancy were identified pre-intervention costing an estimated \$21,621 over 4-weeks.

Reference was made to Amaratunga & Dobranowski's "Systematic Review of the Application of Lean and Six Sigma Quality Improvement Methodologies in Radiology" during project planning [2]. This article highlights several common methodological flaws in previous radiology QI projects. The following factors were incorporated into our project design based on recommendations from this article:

- A pilot project was carried out that helped to familiarize and train radiographers in data collection.
- The project aims, scope and outcome metrics were listed in the project charter prior to commencing data collection. Standardised data collection sheets were utilized. These steps were taken to minimize the risk of selective outcome reporting bias.
- A diverse set of outcomes were measured to try and provide a holistic gauge of the effect of interventions.
- Data were collected before, during and after interventions.

- Time-series data sampling was used for the throughput analysis to limit confounding that may occur due to cyclical variation in patient-prep i.e. residents become more skilled as the academic year progresses which may improve patient-prep. Time-series data collection is “particularly effective at determining whether an intervention has had an effect significantly greater than the underlying secular trend” [2].
- Statistical analyses were performed including p-values and confidence intervals (where possible) to determine significance and gauge precision.

Pre-intervention, patient-prep information was given to referring teams verbally. On the morning of a procedure, a phone call was made to the ward to ensure that the patient was ready for IR. This system provided inadequate patient-prep as demonstrated. The introduction of an IP-prep ward round and a mandatory pre-admission phone call for elective patients carried out using a standardized patient-prep checklist allowed for more efficient identification and rescheduling of non-prepped patients. The checklist contained all the common reasons for non-prep identified during pre-intervention data collection. This meant that clinical expertise was not a pre-requisite for participation in the prep ward round and allowed junior radiologists and radiographers to contribute.

This project led to increased intra and extra-departmental collaboration and communication e.g. IR and vascular surgery collaborated to develop a new Magnetic Resonance Angiography pathway that decreased the number of admissions for lower limb angiograms in IR.

The availability of a robust pre-intervention data set allowed us to convince stakeholders that patient-prep in IR was a real issue that required attention and was key to promoting discussion, buy-in and willingness to take action.

The IR process improvement committee initially focused on monitoring and sustaining improvements from this project. However, over time it became a vehicle for broader process improvement throughout the radiology department as problem areas were identified and new process improvement projects have commenced.

Interventions were carried out by existing staff and were cost-neutral.

- The prep ward round was carried out by the IR intern/fellow. Recently radiographers received approval to take part in the prep ward round ensuring cover when other were unavailable.
- The pre-admission phone calls to elective patients were incorporated into IR administrative staff's daily activities after the presentation of pre-intervention data.
- Educational presentations to teams and ward staff were carried out when IR staff had gaps in their clinical schedule or at the end of multidisciplinary team meetings.
- IR process improvement committee meetings were incorporated into participants clinical schedules.

LIMITATIONS

A randomized trial design is the ideal way to assess the effect of quality improvement interventions [2]. However, it was not feasible to conduct such a project in our clinical environment. The size of the pre-intervention patient-prep data set was limited to 19 days and 132 patients. After the August 2019 pre-intervention data collection period, it took time to receive formal approval to incorporate continuous data collection into daily workflow. The size of the post-intervention throughput data set was limited by restrictions put in place due to the COVID-19 pandemic. Long-term sustainability of improvements has not been determined in this project. We believe that LSS tools are generalizable to other clinical processes, however, further QI projects are needed to confirm this.

TAKE HOME POINTS

- We utilized LSS tools to significantly improve patient-prep, throughput and bed occupancy/cost in our IR department in a cost-neutral fashion.
- LSS provided a framework and platform for multi-stakeholder review and engagement that we found superior to previous ad-hoc attempts at process improvement.
- Consistent process improvement in multiple quantitative metrics was observed over 8-months post-intervention. Determination of long-term sustainability will require further data collection and analysis.

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IR Prep Data Collection Sheet

Time Delay in IR due to non-prep (mins) <input type="text"/>	Patient name: <input type="text"/>	Procedure: <input type="text"/>
	Date of Birth: <input type="text"/>	Date: <input type="text"/>
	Patient ID: <input type="text"/>	Ward: <input type="text"/>
	Male <input type="checkbox"/> Female <input type="checkbox"/>	Referring Physician: <input type="text"/>
	Elective Admission <input type="checkbox"/> Inpatient <input type="checkbox"/> Emergency <input type="checkbox"/>	Team: <input type="text"/>

Basic Prep	YES	NO	N/A	Blood Work	YES	NO	N/A	Special Considerations Cont.	YES	NO	N/A
Triple ID Check	<input type="checkbox"/>	<input type="checkbox"/>		Appropriate blood results available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the patient an insulin dependent diabetic?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LMP Checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safe to proceed post review of bloods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a GKI infusion been administered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correct procedure booked	<input type="checkbox"/>	<input type="checkbox"/>		Medications				Did the patient require steroid prophylaxis (allergy) prior to procedure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IR Invasive form completed on EPR	<input type="checkbox"/>	<input type="checkbox"/>		Is the patient taking anti-coagulants?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If so, has steroid prophylaxis been administered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written informed consent with patient in IR	<input type="checkbox"/>	<input type="checkbox"/>		Has anti-coagulation been held appropriately?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the patient require a PCA post procedure? (e.g., TACE, UFE)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IV cannula/ PICC line in situ on arrival in IR?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the patient on antihypertensives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If so, has this been organised?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the patient require an interpreter?	<input type="checkbox"/>	<input type="checkbox"/>		Have the antihypertensives been administered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the patient require a GA? e.g. (TIPPS, PTC)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If so, is an interpreter available in IR for procedure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Special Considerations				If GA required, has the ward completed a pre op checklist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The patient was fasting appropriately on arrival	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the patient have a normal renal function?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Significant intra procedural event	<input type="checkbox"/>	<input type="checkbox"/>	
The patient was wearing a gown on arrival	<input type="checkbox"/>	<input type="checkbox"/>		Has the patient received pre-hydrated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Please Specify: _____			
The patient's drug Kardex was sent to IR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is Dialysis scheduled for the patient?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
The patient's chart was sent to IR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

Any additional comments or reasons for non-prep:

Name:

Signature:

Was the patient prepped correctly?

Elective Admission Bed Occupancy Time due to Non-Prep

Inpatient-Prep Ward Round Checklist

Patient name:	<input type="text"/>	Procedure:	<input type="text"/>
Date of Birth:	<input type="text"/>	Date:	<input type="text"/>
Patient ID:	<input type="text"/>	Ward:	<input type="text"/>
Male <input type="checkbox"/> Female <input type="checkbox"/>		Referring Physician:	<input type="text"/>

Basic Prep

	Yes	No	N/A
Correct Procedure booked	<input type="checkbox"/>	<input type="checkbox"/>	
IR Invasive form completed on Patient Centre	<input type="checkbox"/>	<input type="checkbox"/>	
Written informed consent completed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there an IV cannula/ PICC line in situ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Can the patient lie flat comfortably?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the patient require an interpreter?	<input type="checkbox"/>	<input type="checkbox"/>	
If so, has one been organised	<input type="checkbox"/>	<input type="checkbox"/>	
For what time: _____			
Ward Staff informed			
that the patient needs to be fasting for at least 4 hours prior to the IR procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
that the patient needs to be wearing a gown prior to departure for IR	<input type="checkbox"/>	<input type="checkbox"/>	
that the patient's Drug Kardex, Signed Consent Form and Chart need to travel with the patient to IR	<input type="checkbox"/>	<input type="checkbox"/>	

Action Taken/ Comments:

Blood Work

Appropriate blood results available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blood results within appropriate range for procedure with reference to IR anticoagulation guidelines	<input type="checkbox"/>	<input type="checkbox"/>	
If not, are suitable measures in place to correct prior to procedure? e.g. blood transfusion, platelet administration, holding of anticoagulant medications, Vitamin K administration etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Action Taken/ Comments:

Medications

	Yes	No	N/A
Is the patient taking anti-coagulation medication?	<input type="checkbox"/>	<input type="checkbox"/>	
Has the anti-coagulation been held appropriately in consultation with the team (refer to IR anticoagulation guidelines)?	<input type="checkbox"/>	<input type="checkbox"/>	
Ward Staff informed that antihypertensive are not to be held on the morning of the IR procedure- they can be administered with a small sip of water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Action Taken/ Comments:

Infection Control

Does the patient have any infection control precautions?	<input type="checkbox"/>	<input type="checkbox"/>
If so, what precaution (e.g. MRSA, VRE, CRE, LRE, COVID-19, TB, HIV)?		
Is there a COVID-19 swab order on EPR?	<input type="checkbox"/>	<input type="checkbox"/>
If so, is the result available	<input type="checkbox"/>	<input type="checkbox"/>
Is the swab positive?	<input type="checkbox"/>	<input type="checkbox"/>
Is the patient under COVID-19 precautions on the ward?	<input type="checkbox"/>	<input type="checkbox"/>
If so, why?		

Action Taken/ Comments:

Special Considerations

Does the patient have a normal renal function?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is pre-hydration required?	<input type="checkbox"/>	<input type="checkbox"/>	
If so, has it been charted and an administered plan discussed with ward staff/ team	<input type="checkbox"/>	<input type="checkbox"/>	
Is the patient an insulin dependent Diabetic?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the patient need to fast for the procedure?	<input type="checkbox"/>	<input type="checkbox"/>	
If so, has a GKI infusion been charted and an administration plan discussed with ward staff/ team for the morning of the procedure?	<input type="checkbox"/>	<input type="checkbox"/>	

	Yes	No	N/A
Does the patient have any contrast allergies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the patient need steroid prophylaxis administered prior to the procedure?	<input type="checkbox"/>	<input type="checkbox"/>	
If so, has it been charted and an administration plan discussed with ward staff/ team?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the patient require a PCA post procedure (e.g. TACE, UFE)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If so, has this been organised?	<input type="checkbox"/>	<input type="checkbox"/>	
If the patient is for a GA e.g. (TIPPS, PTC), has the ward been informed to fill out a pre op checklist for anaesthetics?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Action Taken/ Comments:

Completed by:

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Clinical Audit



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