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Department of Radiology

A Novel Contrast extravasation intake form To Foster Standardized Data Collection and Quality Improvement

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Introduction

- Contrast media extravasation (CMEX): a complication with leakage of IV contrast into the surrounding soft-tissues
- Vary in severity: minor to skin ulceration, compartment syndrome
- Incidence: 0.2% - 0.23%
- CMEX: one of the most frequent adverse events in radiology but are much less studied than others such as contrast-associated acute kidney injury
- Import to recognize the risk factors to reduce complications, improve patient satisfaction at a stressful time

Current reporting system – Safety Net

Welcome to Safety Net
Powered by RL Solutions

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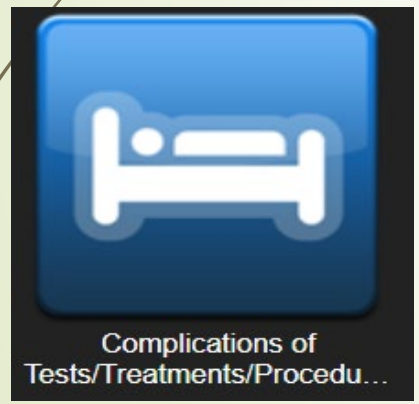


Free text input

Event Details

Complication Of Procedure / Treatment /Test

An event involving any undesired or unexpected clinical complication related to a procedure, treatment or medical test. This category includes **anesthesia events**, **complications following surgery or invasive procedures**, **emergency department issues**, **maternal and neonatal complications**, **healthcare acquired infections**, **catheter or tube problems**, **IV site complications**, etc.

Is This Covid19(Coronavirus) Related? *

Specific Event Type * IV site complication (phlebitis, bruising, infiltration)

PLEASE KEEP YOUR DESCRIPTION BRIEF. THERE IS A 1000 CHARACTER LIMIT.

Describe the Event *

Do you want to create an IS Service Desk Ticket for this issue? *

Are you reporting a problem that was present on admission, or happened before the person affected was under our care? *

Safety Net report example

Case 1	pt came over for ct scan, ruling out head bleed pt very critical iv extrav with only 60 cc of isovue in arm. injection stopped, pt brought back to ER. RN aware ordering MD aware
Case 2	18ga RAC IV flushed without pain prior to CT scan. IV partially infiltrated during injection. Tech called radiology resident, who authorized a reinjection and came to CT to evaluate the patient's arm. Patient had no pain or numbness in her right arm. Patient's nurse made aware.
Case 3	PT came for a CTA of the head/neck with an ultrasound guided iv. IV did not get blood return but multiple flushes were performed and no pain per pt. 60 cc of isovue 370 infiltrated in the iv. RN aware, ordering aware as well as Rad. Pt was sent to MRI for rapid stroke and will perform or decide on the testing post MRI.
Case 4	Patient came pre-medicated for CT. Pt developed hives post injection . Rad aware, ordering aware. Patient being monitored.
Case 5	10ml of DOTAREM and 10ml of saline extravasated during a dynamic injection - the patient did not complain of pain. After the injection there was no contrast evident on the scans. Patient's arm was checked and the skin surface was cool and hard. A new IV was placed and the exam was continued. A neuro rad came over to check the patient's arm and cleared patient.

Free text input

- Not standardized data collection
- Time consuming in a busy working environment
- Easy missing important risk factors
- Not emphasize factors contributing to extravasation
- Difficulty with collecting data retrospectively for analysis and quality improvement

Shortages of current reporting system

Purpose

- To create standardized and mandatory data collecting system
- To reduce data input time
- To better track risk factors
- To facilitate future data retrieval, analysis & quality improvement
- To improve patient care safety

CT Extravasation Intake Form Optimization

Problem Statement

Lack of standard data collection within the current Safety net reporting system for CT extravasations.

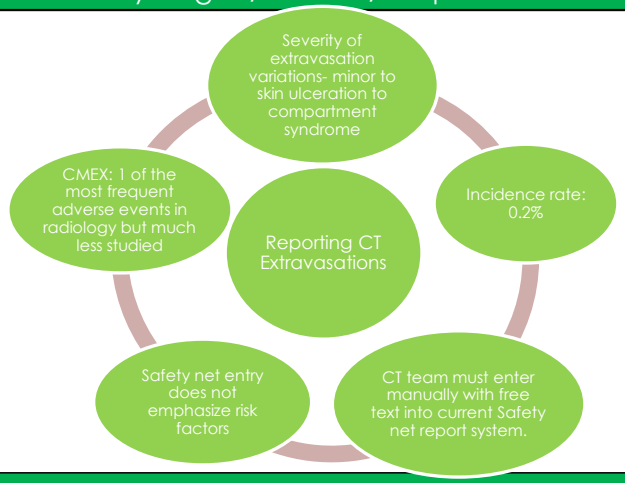
Background

The reporting system is time consuming in a busy work environment, not emphasizing on patient risk factors contributing to the extravasation. This leads to difficulty for retrospectively data analysis and quality improvement.

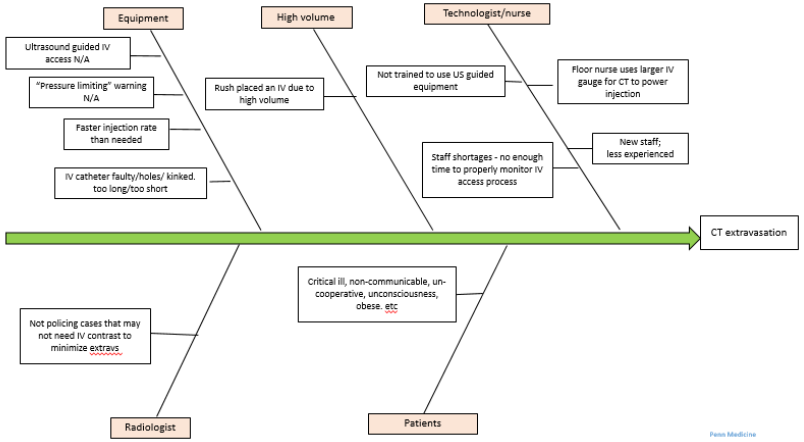
Target State: SMART Goal

To increase the standardized extravasation report by 70%, by the end of 12/2023.

Current State: Identify Target / Actual / Gap



Analysis



Key Drivers

- Safety Net report system time consuming
- No baseline data on CT extravasations including risk factors
- No Dashboard or report card on CT extravasation for review

Interventions / Countermeasures

- Notify UPHS Quality Safety team of Safety net shortcomings and request detailed dropdown options for IV extravasations.
- Request that the "free text" box include smart text or phrases specific to IV extravasations concerns that the technologist can choose from (standardize).
- Develop standard intake excel form housed on the CT computer desktop that the technologists quickly fill out with drop down option that include risk factors.
- Develop a dashboard or report card for analysis and quality improvement.

Sustain Plan

Activity to sustain		Sustain method and frequency	Report to
Create a dedicated PI project	Division head	Form a project team with a project leader and coach.	Chair
Review data monthly	CT leader	CT team review data & trending risk factors at monthly staff meeting	Division head
Radiologists round CT area monthly	Division head	Address any radiologist concerns the technologist may have	Chair

Reliability Level:
(1) Individuals: Feedback, checklists, training, basic standards
(2) Procedures: Embedded standard work, reminders, constraints
(3) Systems: Process design, fail safes, physical layout, built-in feedback, automated systems, concentration of responsibility

Maturity Bars:
0: Untested idea
1: Early tests / PDCA
2: Multiple PDCAs
3: Early implementation
4: Working well in operation

Progress

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Standardized data input

	A	B	C	D	E	F	G	H	I	J	K
1	MRN	Patient status	Gender	Age	Type	Placed by	Experience	IV catheter	US guided IV	"Pressure limiting" warning	Injection location
2		Select below category	Select below		Select below	Select below	Select below	Select below	Select below	Select below	Select below
3	example	Noncommunicatable	Male	> 60 yr	Inpatient						Wrist
4											
5	123456	Normal	Male	> 60 yr	ER	Trauma bed	Experienced	Long	Yes	es	Antecubital
6											
7											

L	M	N	O	P	Q	R
Injection volume	Injection rate	Cannula size	Injection route	Symptom	Further step	Other
Pls input	Pls input	Select below	Select below	Select below	Select below	
100 cc	1.5	22G	Peripheral line	None		For example: other B, other D, other G, other H, Other I
125	5	18G	Peripheral line	None	Monitor	

Drop-down list

Patient status
- Normal
- Non communicable
- Un-cooperatable
- Unconsciousness
- Severe illness
- Obese

Patient type
- Outpatient
- Inpatient
- ER
- ICU

Catheter placed by
- Trauma bed
- ER
- Floor
- CT technician
- CT nurse

Staff experience
- Experienced
- Less

IV catheter type
- Long
- Short

US guided IV place
- Yes
- No

"Pressure limiting" warning
- Yes
- No

IV injection location
- Antecubital
- Forearm
- Wrist
- Hand

Cannula size
- 16 G
- 18 G
- 20 G
- 22 G

Injection route
- Peripheral line
- US - guided
- Utilizing indwelling line
- Power injection

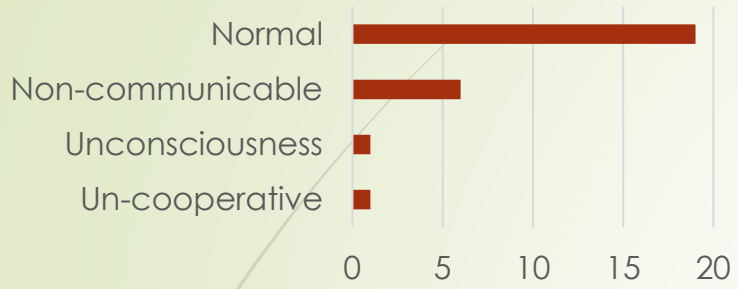
Symptoms
- Pain
- Erythema
- Blister
- Swelling
- Tightness
- Paresthesia
- Compartment syndrome

Further step
- Alternative IV location
- Stop & monitor
- Stop & send patient to floor/ER
- OK with radiologist to diagnose with reduced IV dose
- Call surgeon

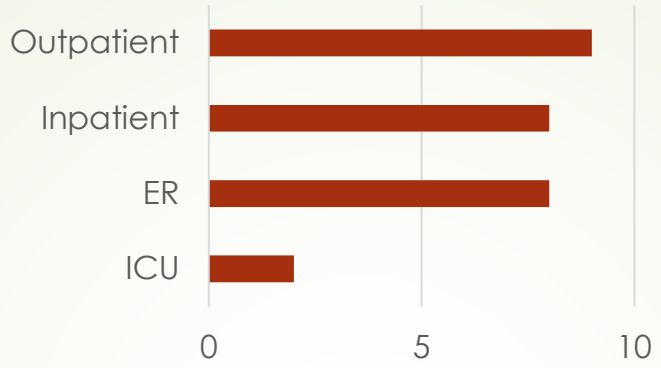
Result

9

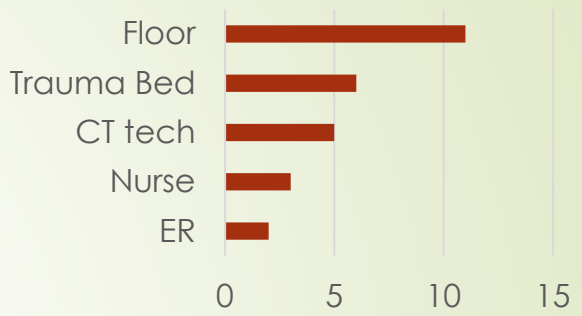
Patient Status



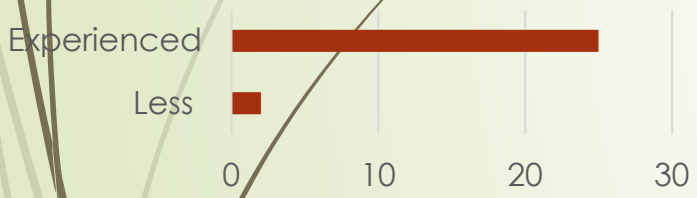
Patient Type



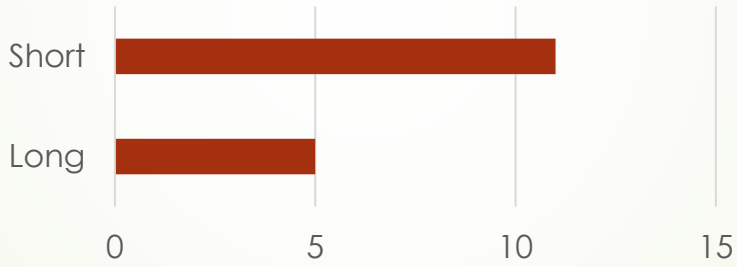
Cath placed by



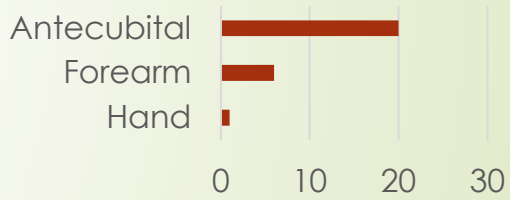
Staff experience level



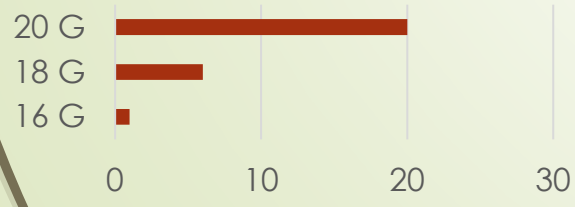
IV catheter type



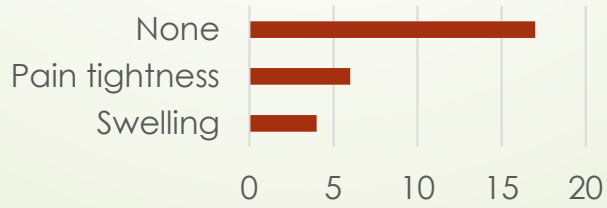
Cath location



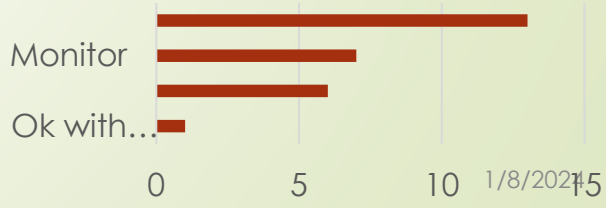
Cath Size



Symptoms



Further step



Feedback from circulating novel input form

- Data/information being collected: satisfactory
- Mostly quick-input process
- Risk factor collection: thorough & inclusive
- Intake form: educational & informative