



QUALITY IMPROVEMENT IN INTRAVENOUS CONTRAST EXTRAVASATION DURING CT

INTRODUCTION

- Contrast reactions vary from minor physiological disturbances to rare severe life threatening situations.
- Preparation for prompt treatment of contrast media reactions must include preparation for the entire spectrum of potential adverse events and include prearranged response planning with availability of appropriately trained personnel, equipment and medications.
- Thorough familiarity with the presentation and emergency treatment of contrast media reactions must be part of the environment in which all intravascular contrast media are administered.
- Extravasation is an adverse reaction to intravenous injection of contrast medium (CM) during CT examination.

AIM

To prevent Extravasation (CM) during CT examination contrast medium

OBJECTIVES

The objective of this study is to determine the frequency, management and outcomes of extravasations and to assess risk factors for extravasation.

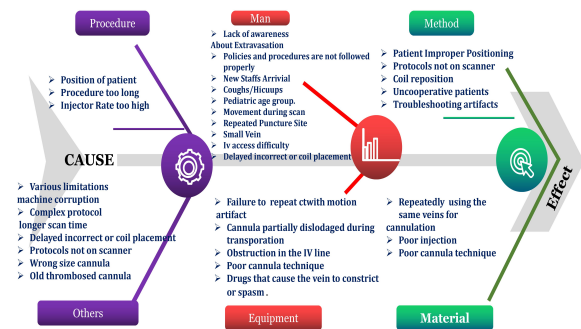
PURPOSE

Establish 3 performance benchmarks for intravenous contrast extravasation during CT examinations: extravasation frequency, distribution of extravasation volumes, and severity of injury. Evaluate the effectiveness of implementing practice quality improvement (PQI) methodology in improving performance for these 3 benchmarks.

RISK FACTORS

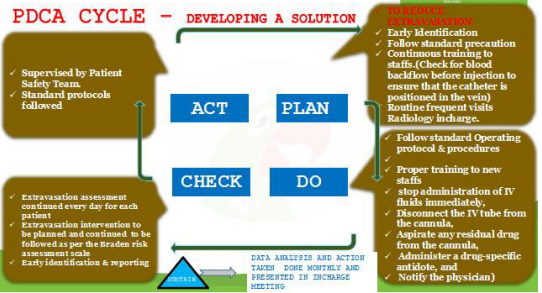
Staff Related	IV Cannulation Technique- Untrained or inexperienced staff, multiple attempts at cannulation
Patient Related	1. Age >60 or <10 2. Fragile veins 3. Compromised Circulation 4. Severe peripheral vascular disease 5. Hypertension, superior vena cava syndrome 5. Hypertension 6. Altered mental status, delirium, dementia. 7. Thrombophlebitis 8. Connective Tissue Disease
Agent Related	pH <5 or >9, High Osmolality, Cytotoxicity- DNA binding more likely than non-DNA binding
Device Related	Metal Needles, Large gauge venflon (<18 gauge), Inadequately secured catheter Location: dorsum of hand or wrist, antecubital fossa
Infusion Related	Duration of infusion, Concentration of infusate, Infusion rate

CAUSE AND EFFECT DIAGRAM



Recognition and Diagnosis of Contrast Media Extravasation

Types	Grade of recommendation
Mild	Minor erythema or swelling, no skin changes
Moderate	Skin blistering, progressive oedema and/or ulceration. These will require close monitoring and physician assessment is advised to assess for any neurovascular compromise by checking peripheral pulse and sensation distal in the affected limb
Severe	Any neurovascular compromise, signs of tissue necrosis or compartment syndrome. This would require urgent surgical attention e.g. emergency fasciotomy

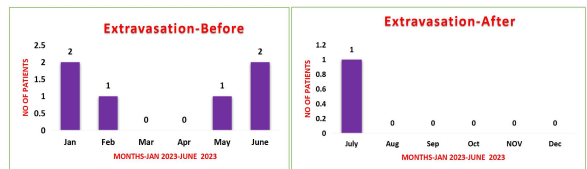


N	Preventative and minimisation measures	Yes	No
1	Meticulous cannula insertion technique using an appropriate size upper arm vein is preferred		
2	An appropriately sized cannula for the vein and anticipated flow rate		
3	Test injection with saline prior to contrast administration		
4	Warming of the contrast medium, especially for higher viscosity compounds		
5	Minimising the volume of contrast administered based upon the indication and patient size		
6	Use of correct flow rates and pressures appropriate to the specific catheter, especially when using central venous catheters		
7	Effective detection protocol which allows early diagnosis, this ranges from direct		
8	Observation to considering use of extravasation detection accessories in high-risk patients		

DATA ANALYSIS

- In early series, the rate of extravasation during CT ranged from 0.03% to 0.17%. Later reports with larger numbers of patients, published after automated mechanical injectors and higher injection rates began to be routinely used for contrast material injection, extravasation rates increased, ranging from 0.25% to 0.9%

RESULTS



CONCLUSION

- For contrast extravasation rate, distribution of volumes of extravasate, and distribution of severity of injury reduced.
- Informed consent before IV contrast.
- Keep all the equipment and trained personal ready before, during and after administration of contrast

REFERENCE

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