

Reducing radiation exposure of the patients undergoing trauma CT in ED

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Mission Statement

To increase the percent of patients undergoing trauma CT that receive optimal radiation* from 11.2% to 60% in 6 months, without compromising on the diagnostic quality.

*(Optimal radiation considered below 1660 mGy cm in terms of DLP)

Team Members

Name	Designation	Role
1 Kabilan Chokkappan	Doctor (consultant DDR)	Lead
2 Pratik Mukherjee	Doctor (Sr consultant DDR)	Member
3 Muthusamy Loganathan	Doctor (resident physician DDR)	Member
4 Wong Whye Yen	ED CT radiographer	Member
5 Rodhiah Bt Mohamed Said	ED CT Sr radiographer	Member
6 Mervyn Liang Ming Fok	Physicist	Member
7 Shobhit Swarup	Doctor (Senior consultant, ED)	Resource person

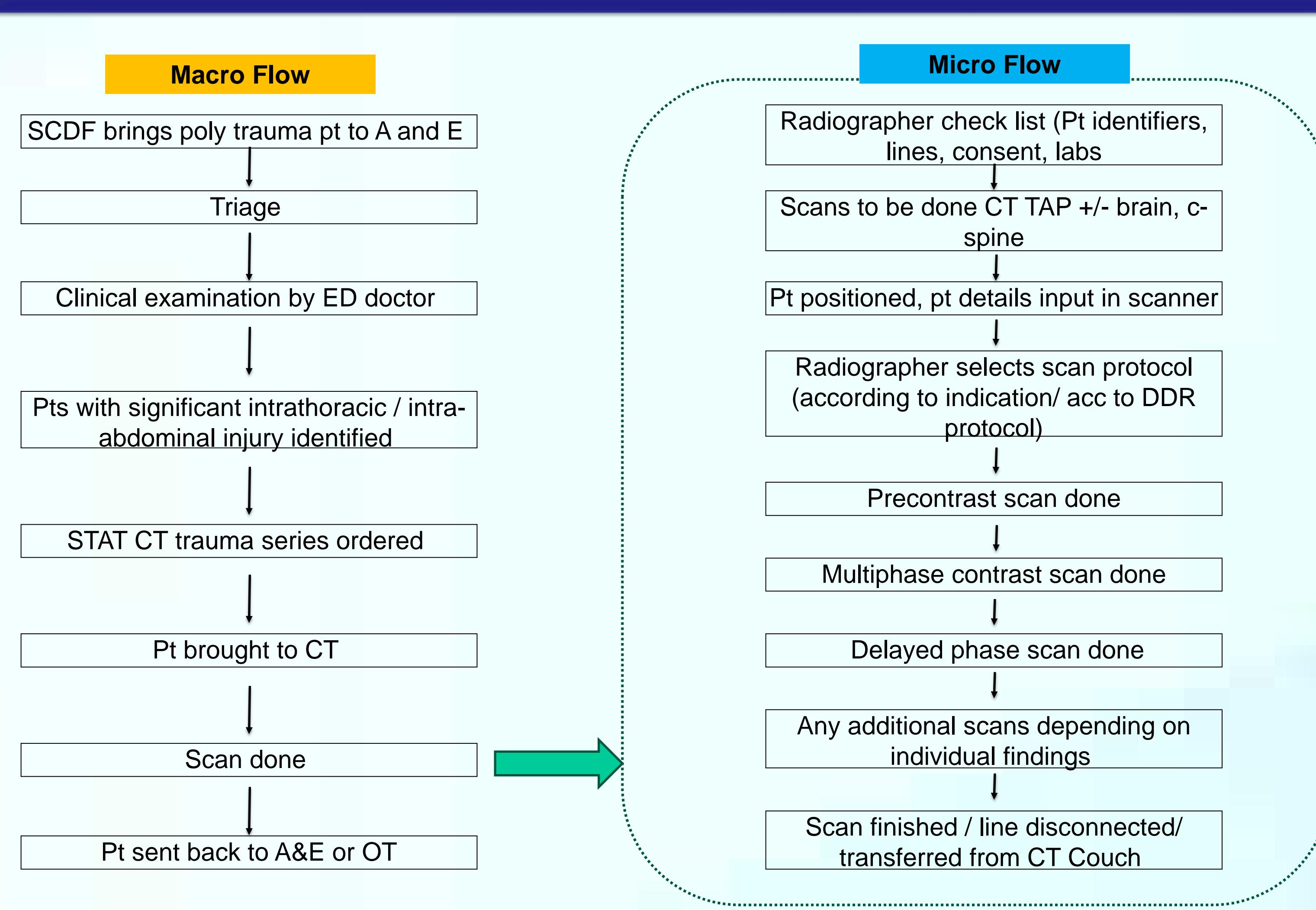
Evidence for a Problem Worth Solving

	effective dose in mSv
KTPH*	55-58 (Average DLP 3227)
International guidelines	
Reference 2	26.12
Reference 3	38

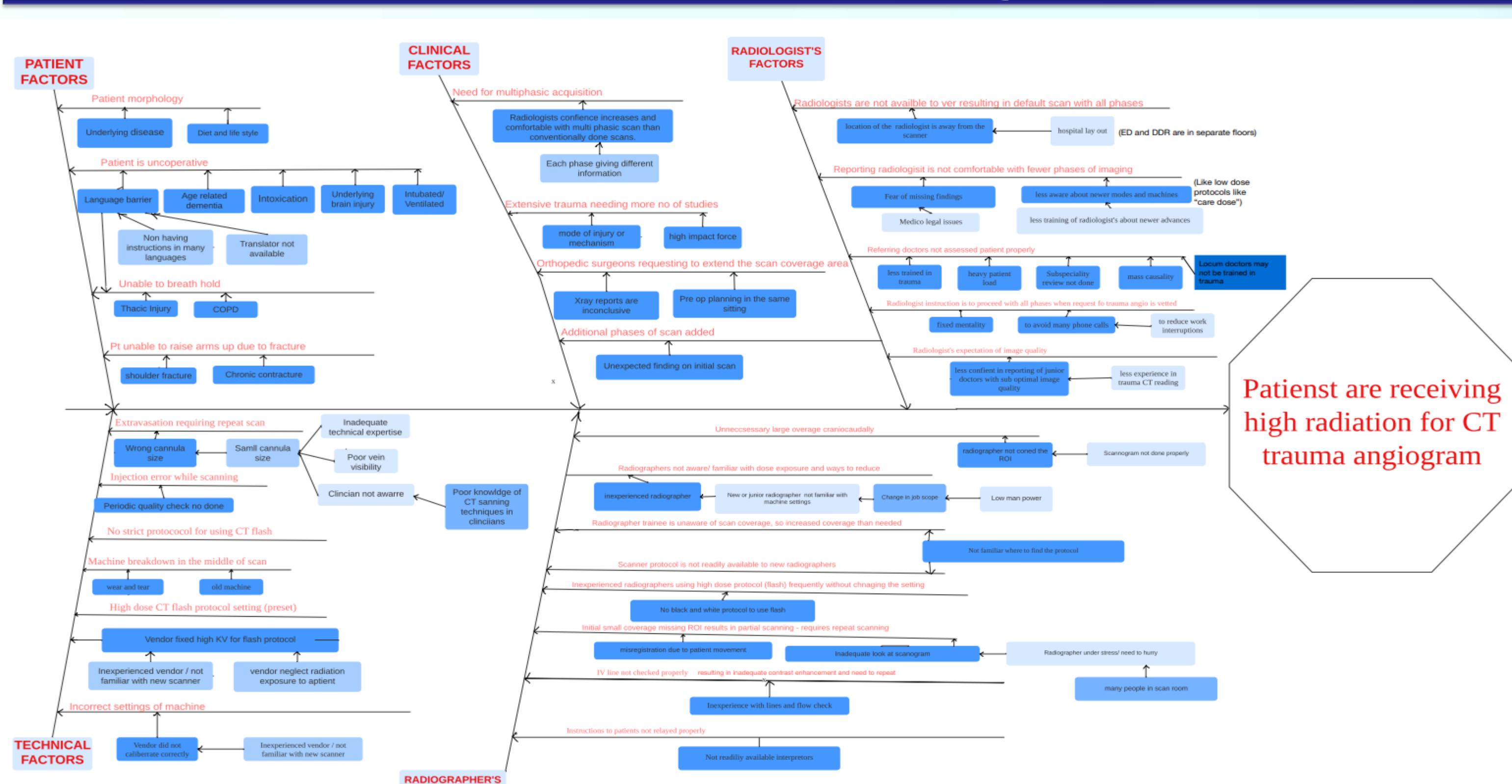
Current Performance of a Process



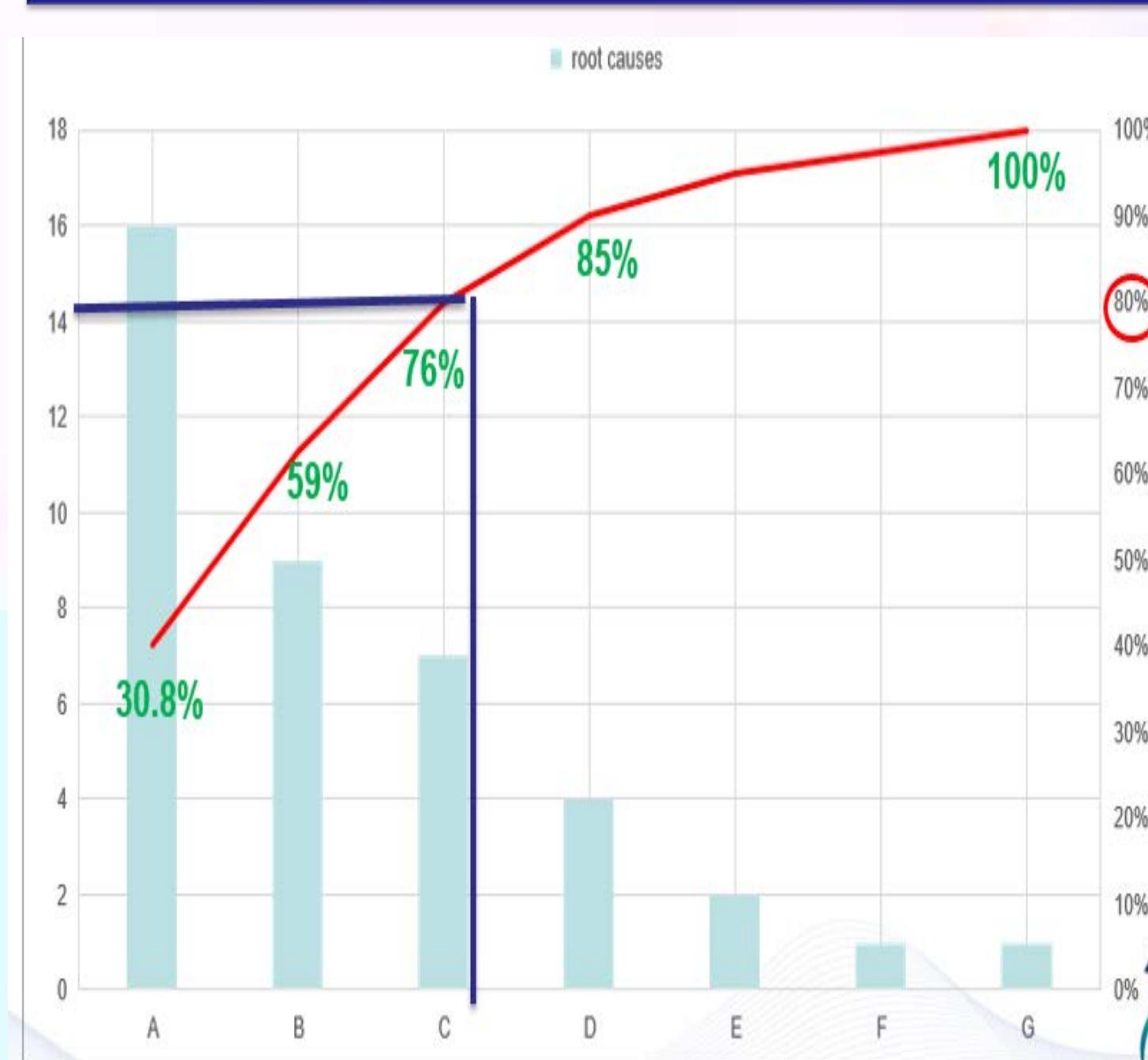
Flow Chart of Process



Cause and Effect Diagram



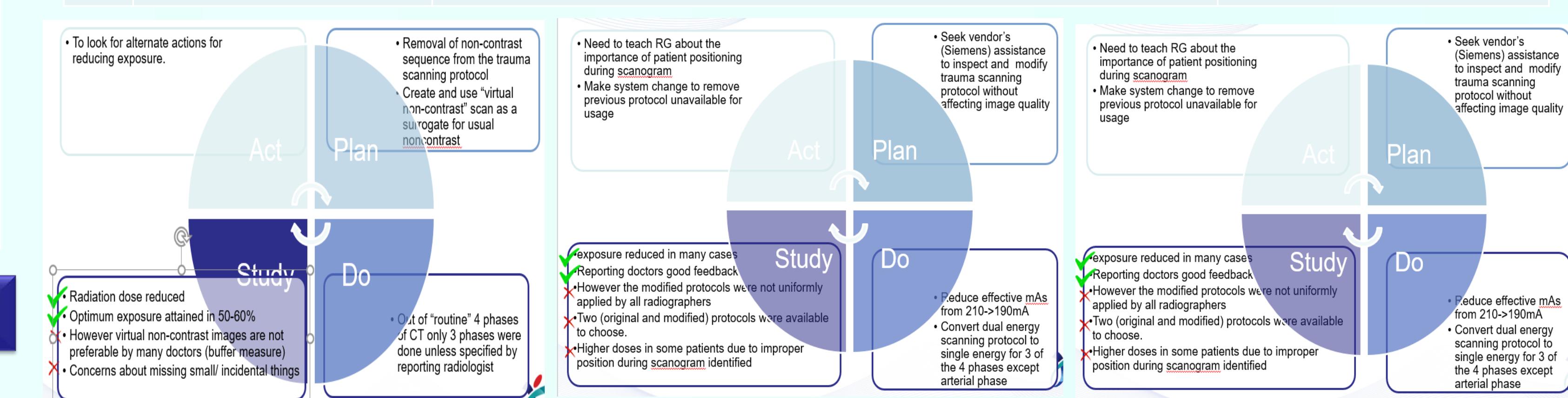
Pareto Chart



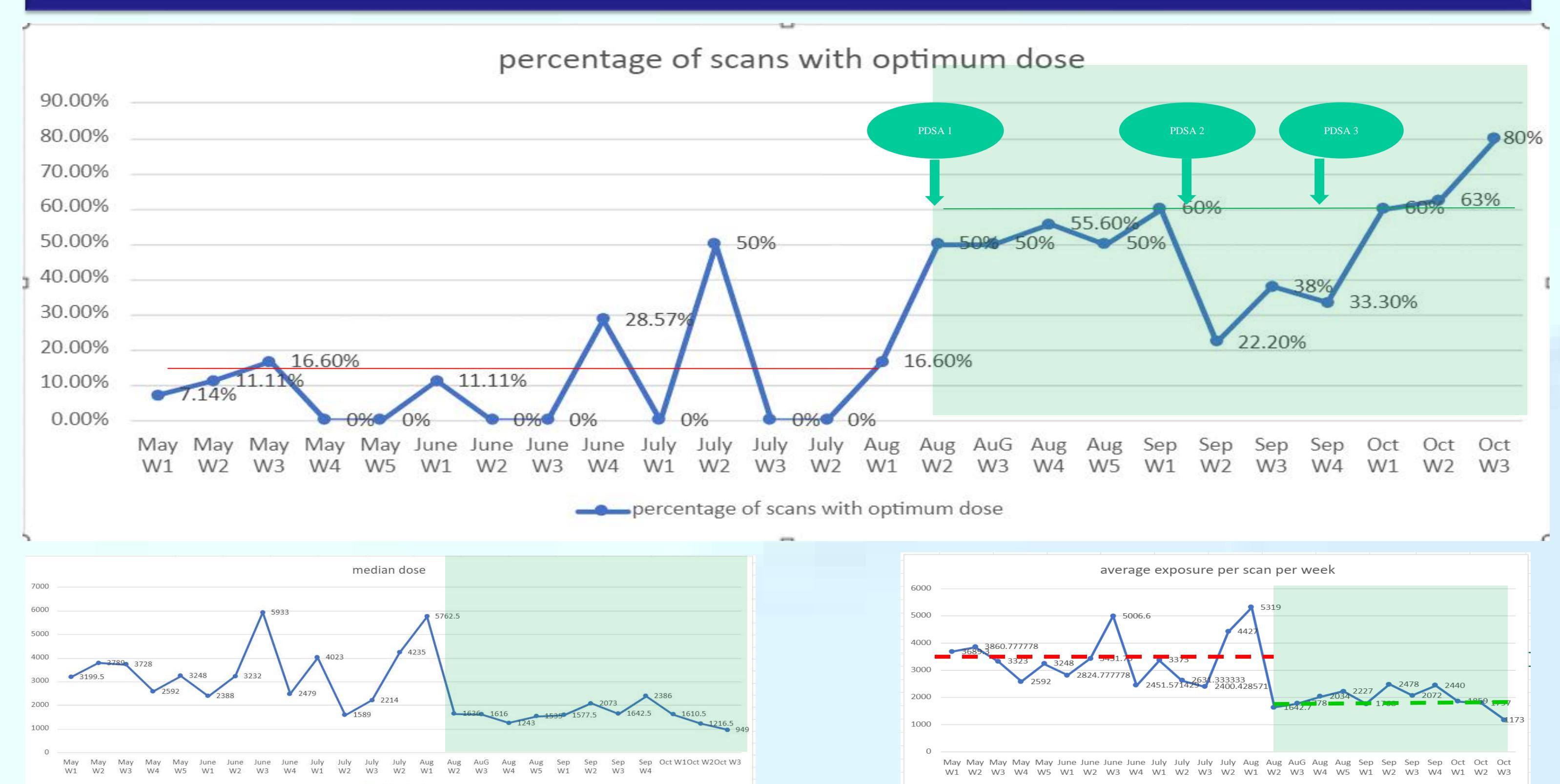
	Root causes	Vote s
A	No black and white guideline for using FLASH protocol	16
B	Fixed mentality of doctors to use default 4 phase scans	9
C	Suboptimal scan setting	7
D	Less training for Drs and RGs	4
E	Unexpected findings leading to more scans	2
F	Decreased confidence in reporting with lesser phases	2
G	RG not familiar where to find various CT protocols	1
H	Scannogram not proper	1

Implementation

Order	Root causes	Interventions	Date of implementation
B	Fixed mentality of doctors to use default 4 phase scans	Consider removal of noncontrast CT sequence for 10 patients and assess 1. Diagnostic confidence 2. Accuracy 3. Reporting radiologists' comfort level	Week 2 Aug 2023
A	No black and white protocol for using FLASH protocol in trauma CT	Review the indications for using FLASH protocol and optimise Establish clear guidelines for using FLASH protocol and broadcast to RG	15 Aug 2023
C	Suboptimal scan setting to reduce radiation dose to the patient	1. Bring vendor for the review and tweaking of existing scan protocols aimed towards reducing overall radiation to patients 2. Reassess the RG's scanning methods including patient positioning etc	1.W2 Sep 2023 2.W3 Sep 2023



Results



Cost Savings

- Reduced number of images sent to the PACS: reduced need of PACS cloud storage
- Reduction of radiation exposure to the patient: reduced number of potential radiation related adverse effects and healthcare costs
- Reduction of radiation exposure to the DDR staff
- Increase in the tube life: from reduced tube current

Problems Encountered



Strategies to Sustain

Assign dedicated person to audit 6 monthly the radiation exposure of trauma CT patient and maintain a registry