

Reducing radiation exposure of the patients undergoing trauma CT in ED

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Aim

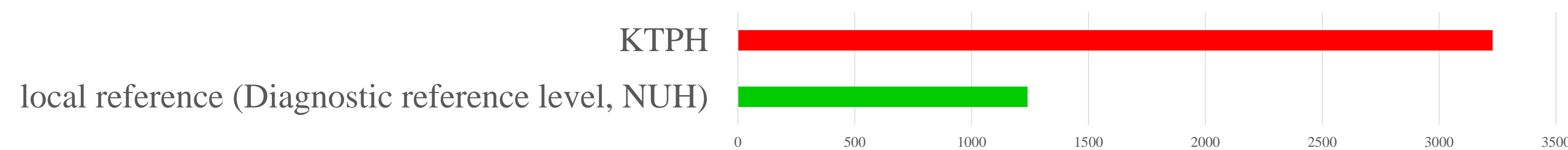
To increase the percent of patients undergoing trauma CT that receive optimal radiation* from 11.2% to 60% in 6 months, without compromising on the diagnostic quality.

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

Background

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

Radiation dose (DLP) in mGycm

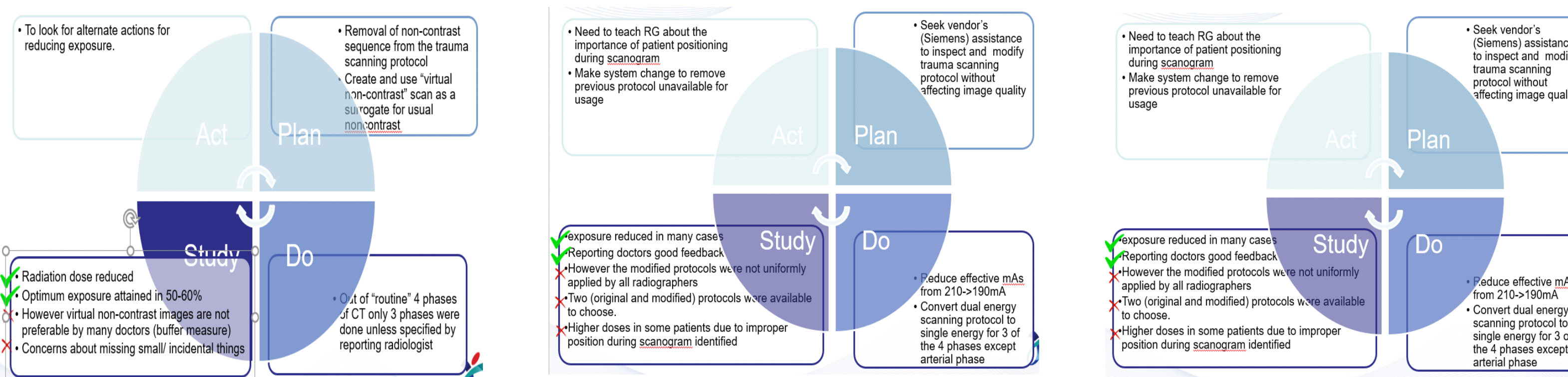


Team Members

Name	Designation	Department
Kabilan Chokkappan	Doctor (consultant DDR)	DDR
Pratik Mukherjee	Doctor (Sr consultant DDR)	DDR
Muthusamy Loganathan	Doctor (resident physician DDR)	DDR
Wong Whye Yen	ED CT radiographer	DDR
Rodhiah Bt Mohamed Said	ED CT Sr radiographer	DDR
Mervyn Liang Ming Fok	Physicist	DDR
Shobhit Swarup	Doctor (Senior consultant, ED)	ED

Interventions : Implementation

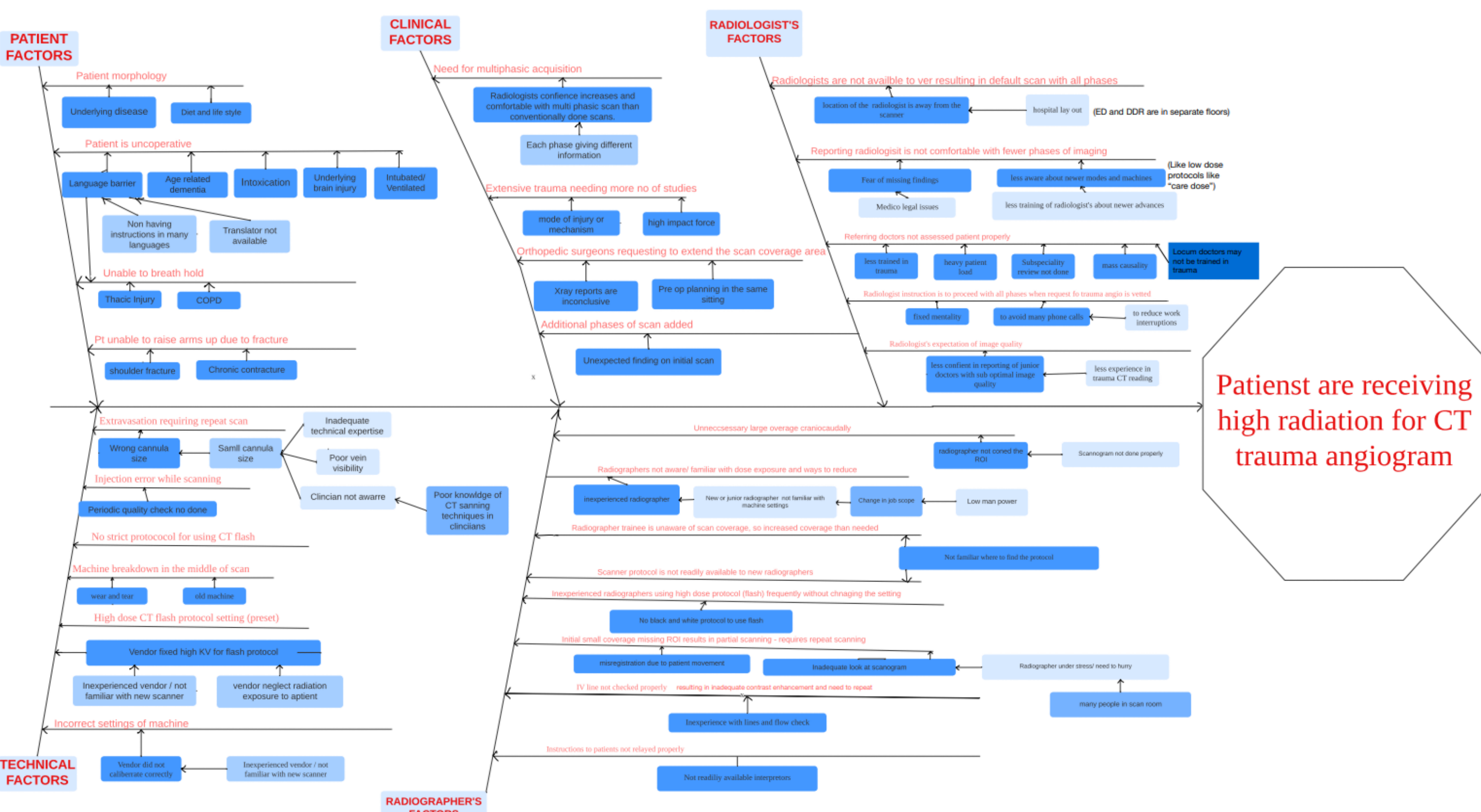
	Root causes	Interventions
B	Fixed mentality to use default 4 phase scans	Consider removal of noncontrast CT sequence for 10 patients and assess diagnostic confidence, accuracy, radiologists' comfort level
A	No protocol for using FLASH in trauma CT	Review the indications for using FLASH protocol and optimise Establish clear guidelines for using FLASH protocol
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



Onward 2026

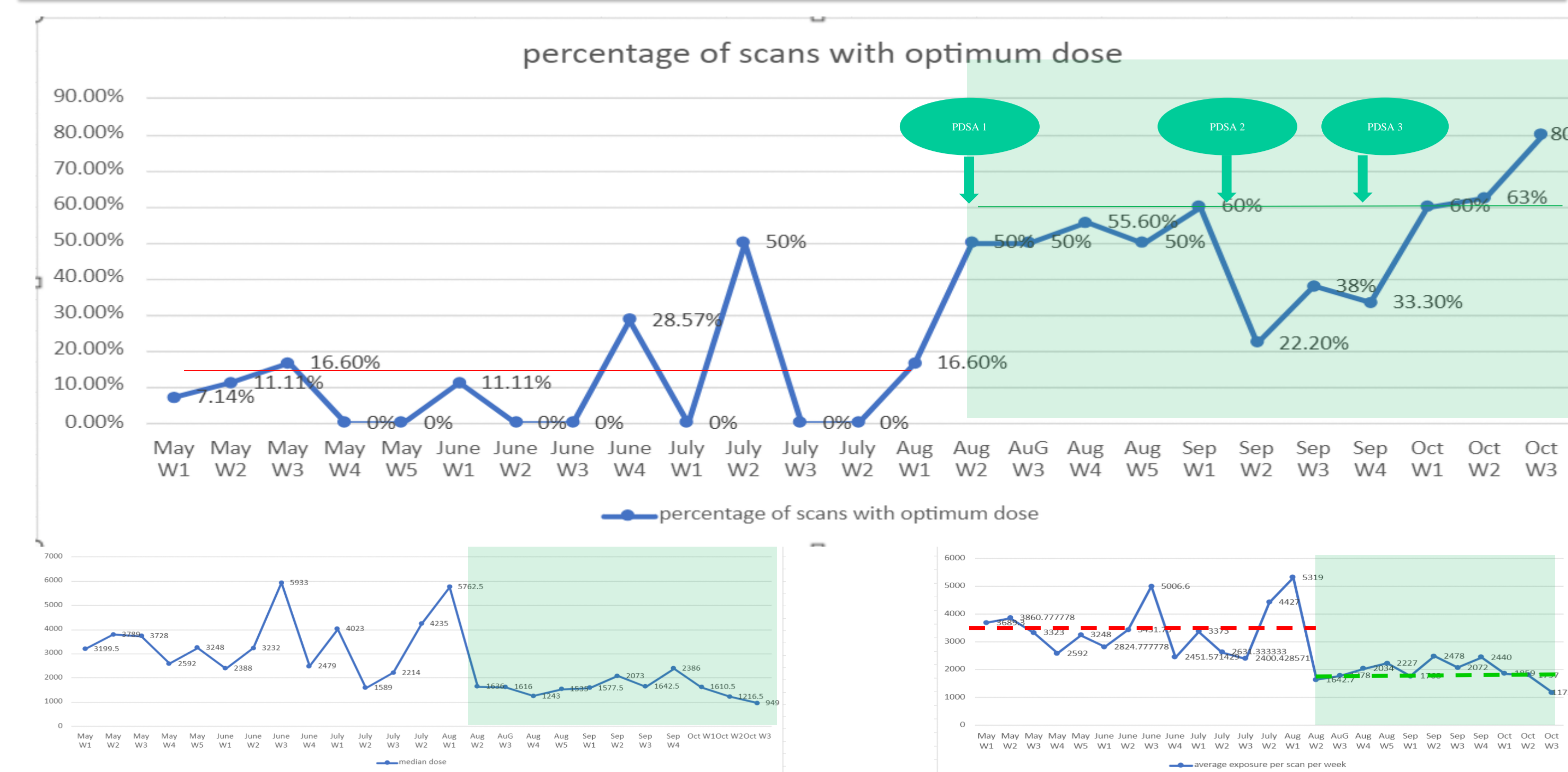
- Minimizing Health Risks**
 - Excessive radiation exposure increases the risk of developing radiation-induced cancer
- Protecting Vulnerable Populations**
 - Often young population is involved in polytrauma. Reducing exposure is critical to minimize long-term risks
- Optimizing Accuracy with Safety**
 - Advances in CT technology allow clearer imaging at lower dose.
- Reducing Long-Term Side Effects**
 - Minimizing radiation exposure reduces the chances of long-term effects, such as genetic mutations
- Promoting Patient Confidence**
 - Patients trust and comply with imaging procedures when they know safety precautions are in place

Interventions : brainstorming / planning



Patient are receiving high radiation for CT trauma angiogram

Results & Outcomes

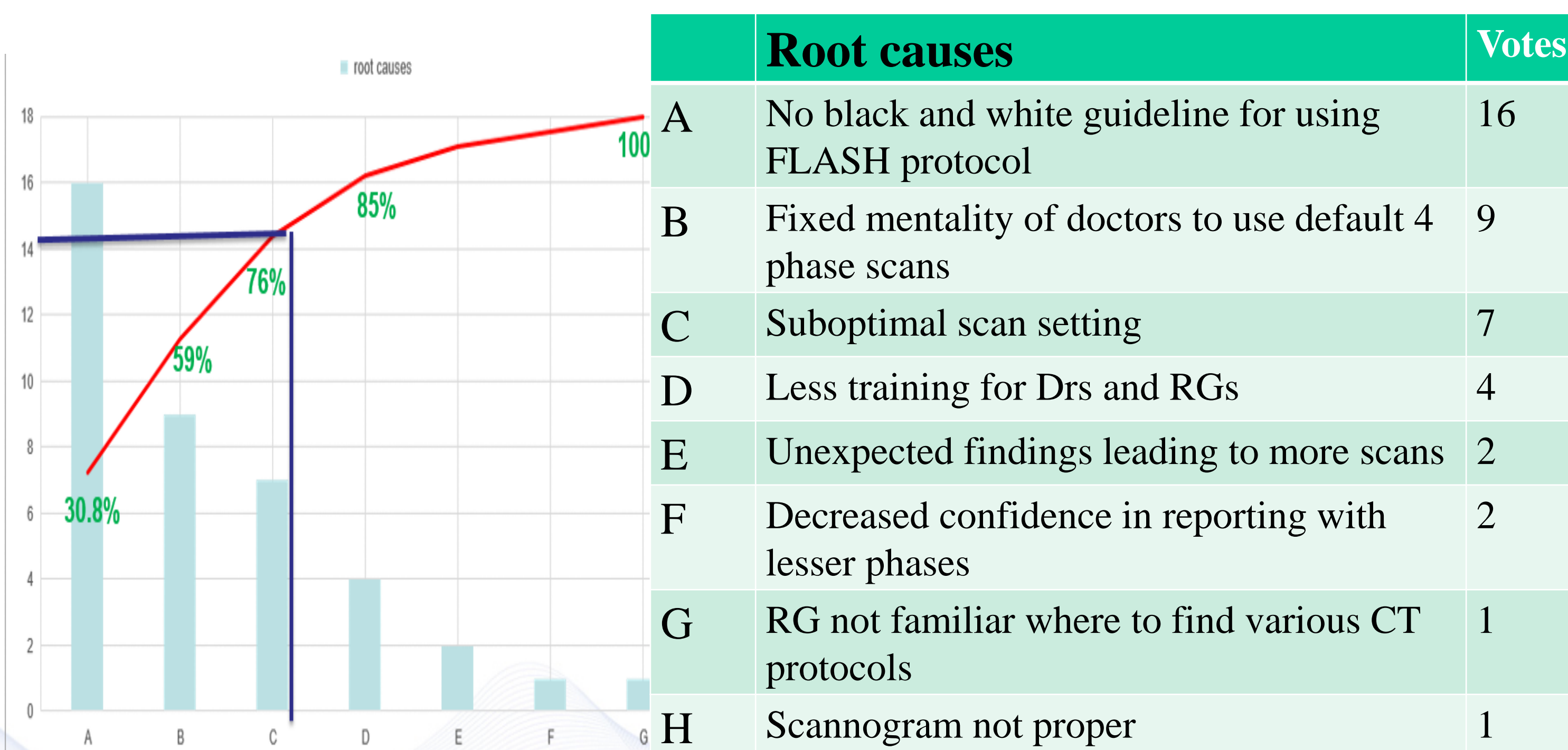


Cost Savings

- 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

Conclusion

- CT is the most accurate and cost-effective method to evaluate severe blunt abdominal trauma in hemodynamically normal patients.
- Polytrauma patients receive a substantial dose of radiation during initial and subsequent follow up CT imaging. Radiation exposure is cumulative.
- The low individual risk of cancer becomes a greater public health issue when multiplied by a large number of examinations.
- Attention to minor details and optimising scanning protocols can bring up desirable reduction in radiation exposure.



Root causes	Votes
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