

Mission Statement

To improve the percentage of outpatients with urinary stones referred to radiology department who undergo dual energy computed tomography (CT) scan from 58% to 80% within 6 months

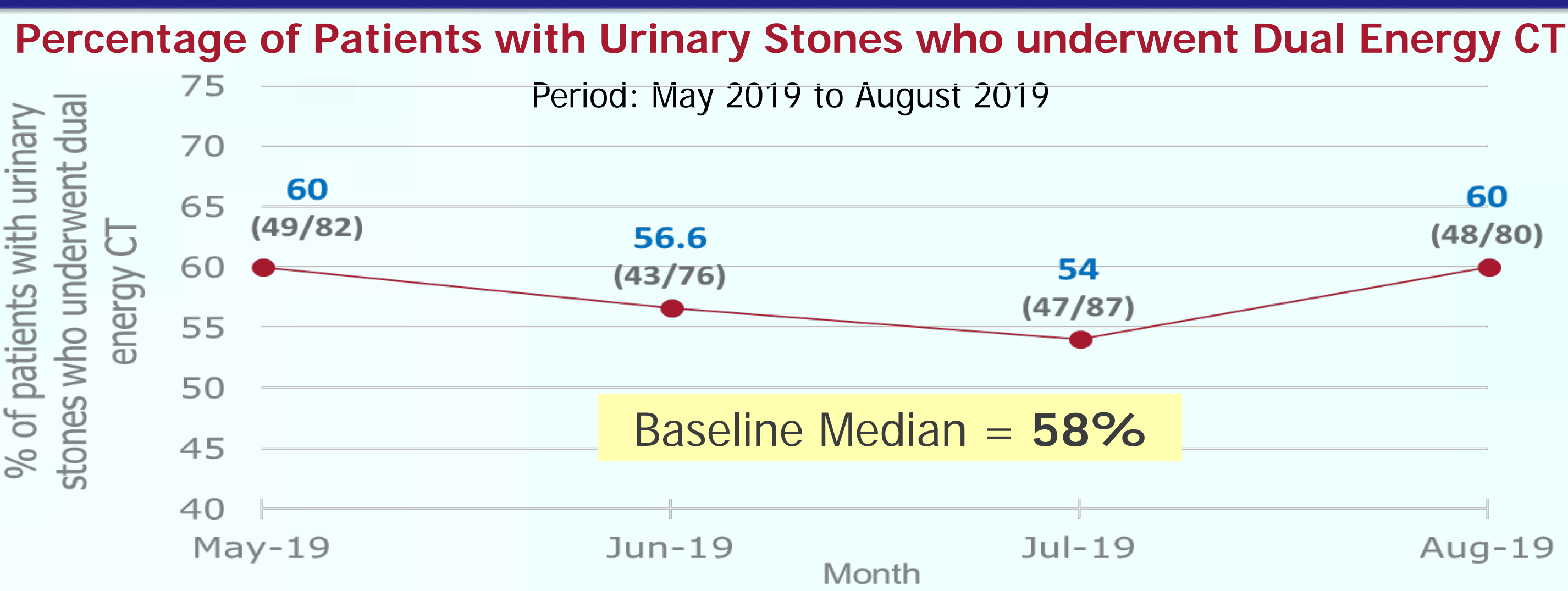
Team Members

	Name	Designation	Department
Team Leader	Dr Lee Chau Hung	Consultant	Radiology
Team Members	Dr Yeow Yuyi	Associate Consultant	Urology
	Ms Ong Ee Ling	Senior Radiographer	Radiology
	Mr Lawrence Chin	Senior Radiographer	Radiology
	Ms Sabrina Sabtu	Head PSA, Clinic 2A/2B	Urology
	Dr Salada Rolando	Resident Physician	Urology
Sponsors	Adj A/Prof Gregory Kaw	Head of Department	Radiology
	Ms Chow Mui Gek	Nurse Manager	Radiography Service
Facilitator	Adj A/Prof Chong Yew Lam		

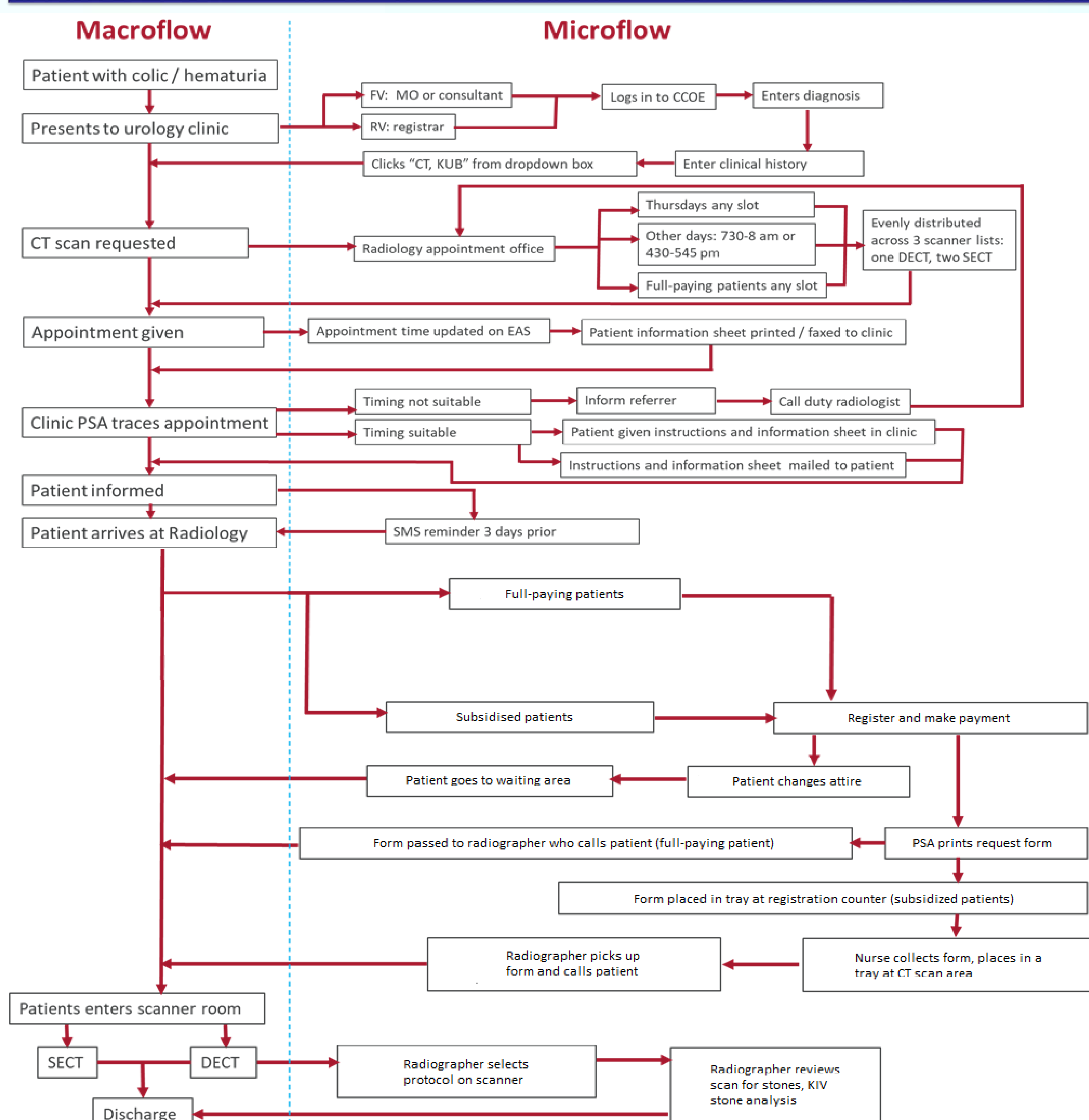
Evidence for a Problem Worth Solving

- Dual energy CT is an established tool in differentiating uric acid and non-uric acid urinary stones
 - Hidas G et al. Determination of renal stone composition with dual-energy CT: in vivo analysis and comparison with x-ray diffraction. *Radiology*. 2010.
 - Ilyas M et al. Dual-energy computed tomography: A reliable and established tool for in vivo differentiation of uric acid from non-uric acid renal stones. *Niger Postgrad Med J*. 2018.
- Differentiating uric from non-uric acid urinary stones is important to determine if medical or surgical management is more appropriate
 - Kambadakone AR et al. New and evolving concepts in the imaging and management of urolithiasis: urologists' perspective. *Radiographics*. 2010.
 - Cameron MA et al. Uric Acid Nephrolithiasis. *Urol Clin North Am*. 2007.

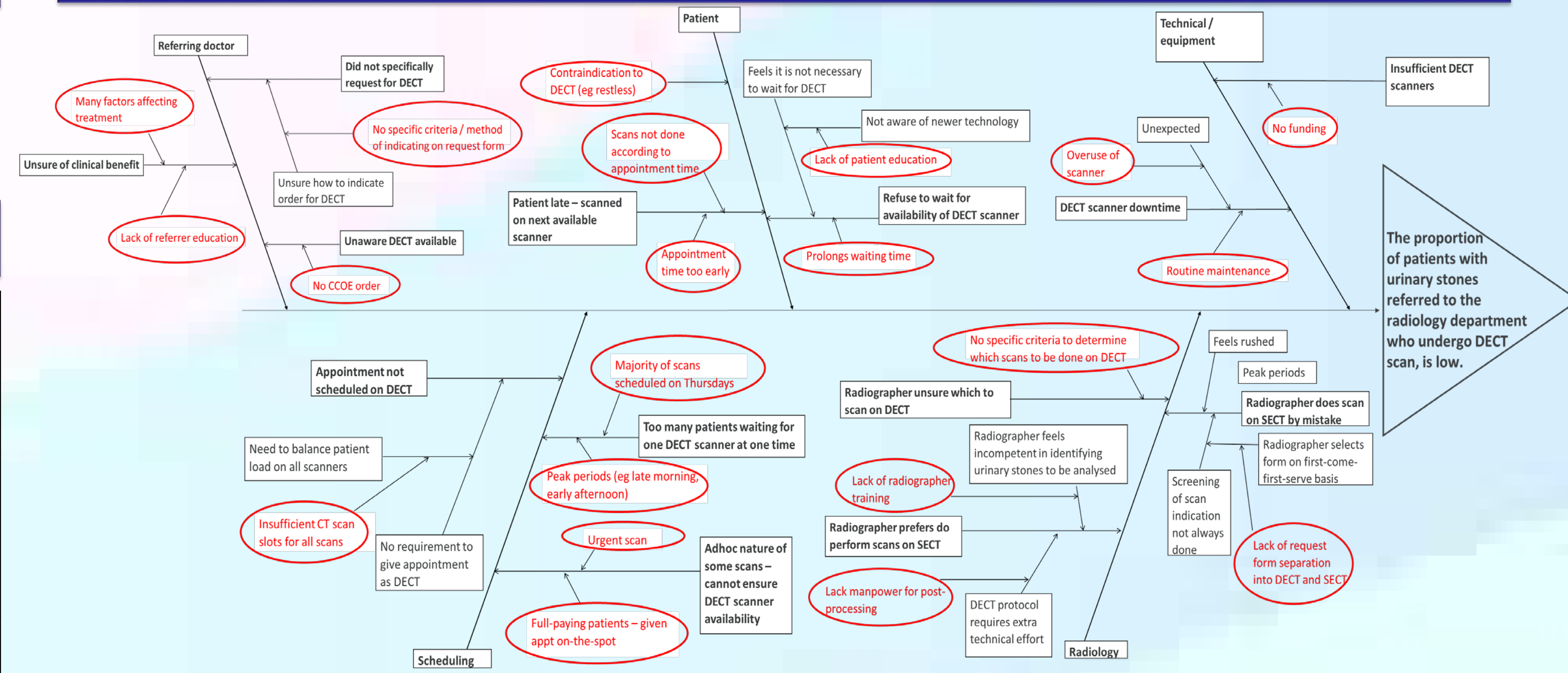
Current Performance of a Process



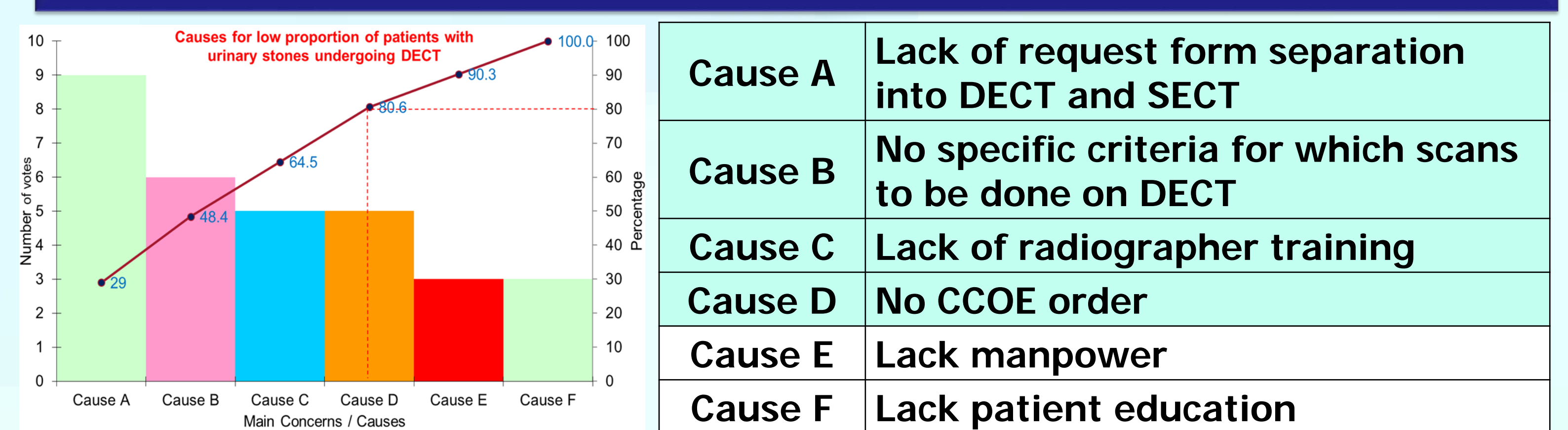
Flow Chart of Process



Cause and Effect Diagram



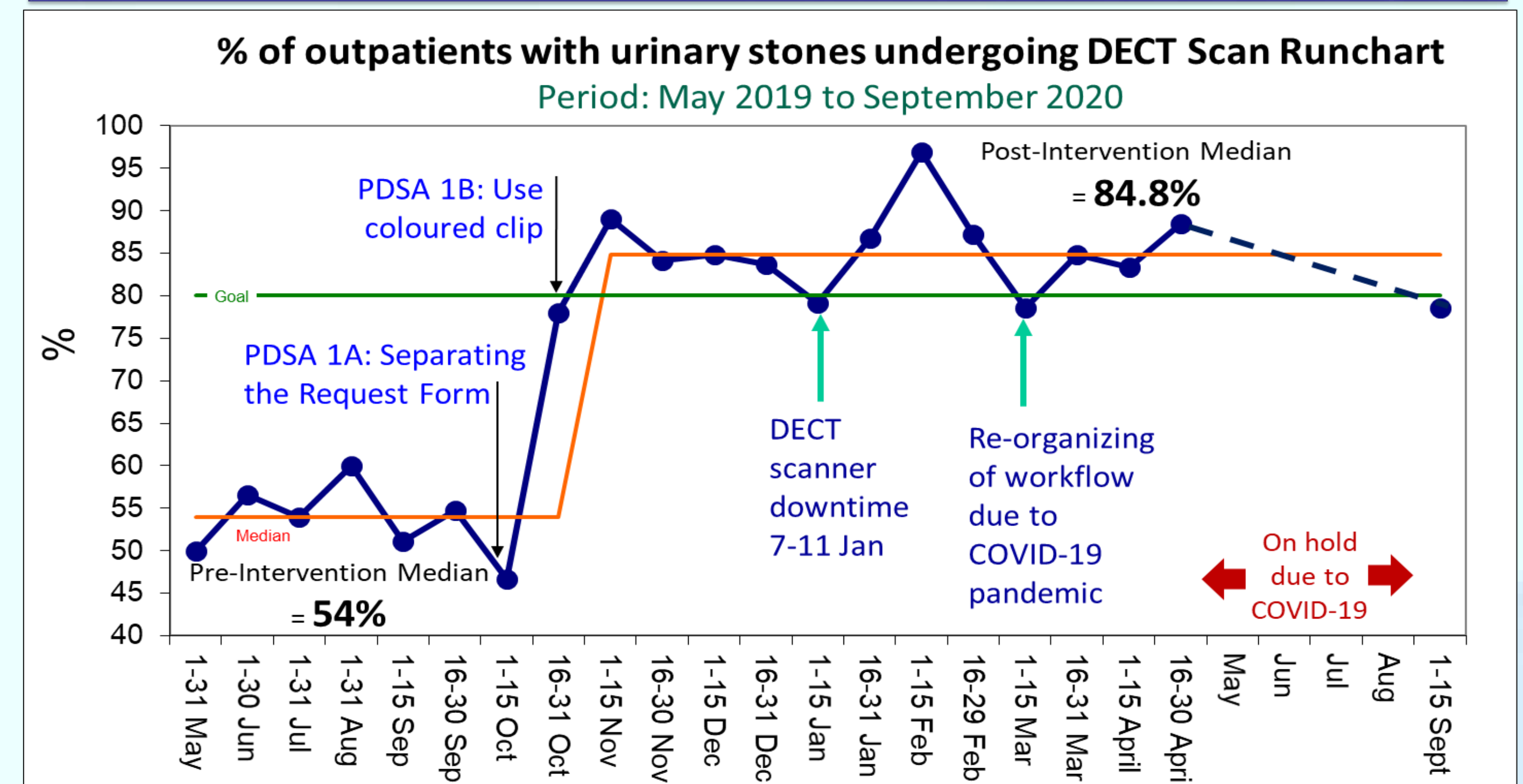
Pareto Chart



Implementation

Root Cause	Intervention	Implementation Date
Lack of request form separation into DECT and SECT	Separate CT KUB request forms from the other request forms in the CT scan room	16 Oct 2019

Results



Cost Savings

	Pre-Intervention Period: 1 Aug-15 Oct 2019	Post-Intervention Period: 16 Oct-31 Dec 2019
No. of patients who underwent medical therapy	0	6
No. of patients who underwent surgical therapy	5	1
Total Cost Savings (in ~2.5 months)	$(5 \times \$1000) - (6 \times \$31.50 + 1 \times \$1000) = \$3,811$	
Total Cost Savings (Annualized)	\$18,292.80	

Note:

- No additional cost to patient for DECT scan
- Cost of medical therapy per patient = \$31.50 (for 6 months)
- Cost of surgical therapy per patient = \$1000

Problems Encountered

- Identifying macroflow and microflow with the team.
- Convincing staff on the ground of the problem worth solving.
- Planning interventions that are effective, yet least disruptive for maximum compliance.

Strategies to Sustain

- This CPIP has demonstrated that it is possible to perform CT KUB scans of >80% of patients with urinary stones on DECT with minimal impact on balance measures.
- In the long term, it would be feasible to create a CCOE order for dual energy CT KUB (addressing root cause D).
- The requesting clinician would be able to place a specific request for dual energy CT KUB.
- Radiology department could discontinue the use of the paper clips.