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& MEDICAL RESEARCH CENTRE

Practical Case Study : Optimization of Instruments

Ms. Netra A Vaidya

Sr.Manager

P . D. Hinduja National Hospital And Medical Research Centre

Mahim- Mumbai 400 016

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Learning Objective :

- To study process of surgical instrument tray optimization with a view on getting right instrument for right procedure
- To check on cost benefit of optimization

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- The term Optimize is “to make perfect”.
- It is defined as follows: choosing the best element from some set of available alternatives.
- An art, process, or methodology of making something (a design, system, or decision) as perfect, as functional, as effective as possible.

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Objective:

- To determine variable.
- To quantify response with respect to variables.
- Find out the optimum.

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- In development projects in any industry generally experiments by a series of logical steps, carefully controlling the variables and changing one at a time until satisfactory results are obtained . This is how the optimization should done in any industry.

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- Advantages yield the "best solution" within the domain of study.
- Require fewer experiments to achieve an optimum formulation.
- Can trace and rectify "problem" in a remarkably easier manner.

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Stake Holders :

- CSSD Senior Staff
- Theatre Nurse
- Surgeon

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- Aim – To check the quality and quantity of instruments of sets in circulation thereby optimizing the set

- Goal – To achieve right instrument for right surgery

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- Zeroed Down on the type and number of sets to be checked
- Communicated with all the stake holders
- Deputed a team comprising of senior, middle level and a junior technical staff

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- Out of total 19280 instruments from circulation it was decided to check 11467instruments belonging to o.t sets as critical instruments.
- The other 7813 instruments were dropped out of check been non critical/ not under purview of CSSD been electrical equipment's/ wards.
- All 11467 instruments were checked in a span of a month without disturbing the surgical process flow.

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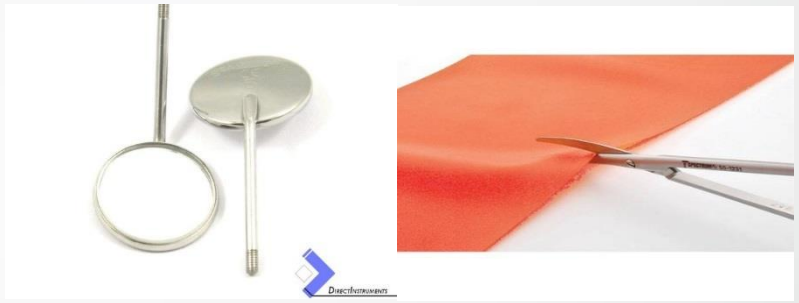
O.K

Repairs

Replacement



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Results

- 70% of the instruments were found to be o.k
- 18 % of the instruments needed repairs (sharpening, miss- aligned, wear and tear)
- 12% needed to be replaced

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Optimization

Sr.No	Name of the Set	No. of Sets Prior to Revision	No of Sets Post Revision	Instrument Count - old	Instrument Count - New	Total Instruments	Reduction in Instrument Count	No of terns on reprocessing - Sterilization For 6 Months	Reprocessing in a month
1	Cardiac Thoracotomy	1	1	109	5	5	104	2	1
2	Cardiac Rib Resection	1	0	29	7	7	22	4	
3	Coronary	5	5	33	10	50	23	40	13
4	Embolectomy	1	1	94	6	6	88	1	
5	PDA Set	1	1	13	13	13	0	1	
6	Neonatal Set	1	0	124	9	9	115	4	1
7	Basic Set	13	13	79	57	741	22	126	21
8	Plastic Set	8	8	48	38	304	10	63	11
9	Ear Major Set	3	3	58	52	156	6	18	3
10	Ear Minor Set	3	3	23	23	69	0		
11	General Laparoscopy Set	5	5	67	67	335	0	50	9
12	Gynaec Laparoscopy Set	1	2	70	45	45	25	12	2
13	Neuro General	4	4	202	164	656	38	42	7
14	V.A & VP	1	1	154	151	151	3	8	2
15	Aneurysam	1	1	43	32	32	11	8	2
16	D&C Set	6	6	72	56	336	16	29	5
17	Vascular Set	5	5	31	11	55	20	41	7
18	Sternal Wiring	5	5	17	17	85	0	39	7
19	Dental Extraction Set	2	0	16	0	0	16	8	2
20	Extra Instruments for Dr.Sultan PradhanSetNo I	2	2	9	6		3	12	2
21	Extra Instruments for Dr.Sultan PradhanSet No II	0	1	0	8	8	0	12	2
Total and Average Reprocessing		69	67	1291	777	3063	522	26	5.7059

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Cost Calculations

Total Number of Instrument Reduced	522
Average Number of Instruments in a tray	70
Total Number of trays reduced	8

Time utilized in different sections

Work Load	
Time Required to open the instrument Tray in minutes	5
Time Required to Prepare a tray	15
Average Salary of the staff in Rs	244
Total Number of trays	8
Cost of detergent /Liter	1200
Per Cycle Detergent use in ml	240
Cost of Detergent use	288
One set would need 2 baskets that would go in one cycle. Therefore number of cycles required	8

Costing in different work areas

Cost Saving	
Total Cost Required to open up the instrument Trays	9760
Total Cost Required to Pack the instrument Tray	29280
Total Cost of detergent used	288
Sterilization Cost	1500
Water Cost	50
Packaging Cost	400
Grand Total Cost in Rs / processing	**41278**
	=784282 AED

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Achievement

- We could get right instrument for right surgery with reduction in cost and improve patient care

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References :

Instrument Management - bbraun.com

*https://www.b**braun**.com/.../**optimization**/instrument-management.html*

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