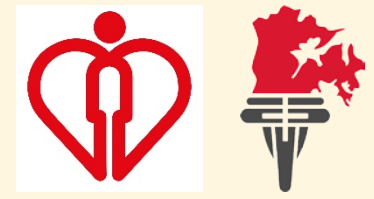


SMART Orthopedics Spinal Institute (OSI) Surgical Table Preparation Eliminate 55 Pounds Repetitive Manual Lifting



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- (2) Department of Anesthesia, Pain and Perioperative Medicine PWH
- (3) Department of Orthopedic & Traumatology (O&T), PWH
- (4) Department of Occupational Safety & Health (OSH), PWH



Our journey

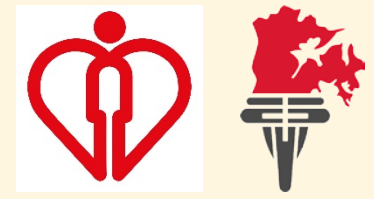
- Care manager in OMCS onsite visit to PWH OT to facilitate an injured staff getting back to work.
- During the onsite visit, an occupational hazard was identified in OSI table preparation by orthopedic PCAs
 - OSI surgical table is designed for spinal trauma patient positioning in surgical procedures

Injury Management



Injury Prevention





Job duty of orthopedic PCA in OT

Limbs disinfection



**Maneuver bulky
OT equipment**



**Set up OT table
accessories**



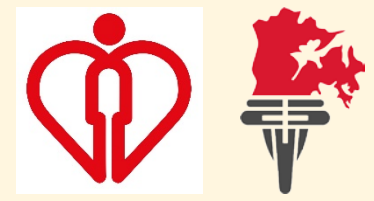
Patient transfer



**Essential in preoperative preparation and intra-operative support
Their work is labour intensive involving lots of MHO**

Adjusting surgical lamp





Original OSI table preparation process

PCA are required to take different accessories from factory rack and fix it on OSI table framework, including the table platform

OSI table accessory rack

55 lbs

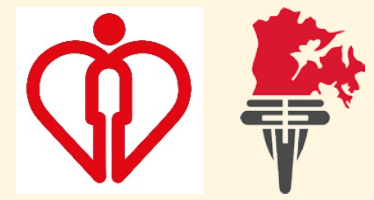


OSI table framework



Prepared table



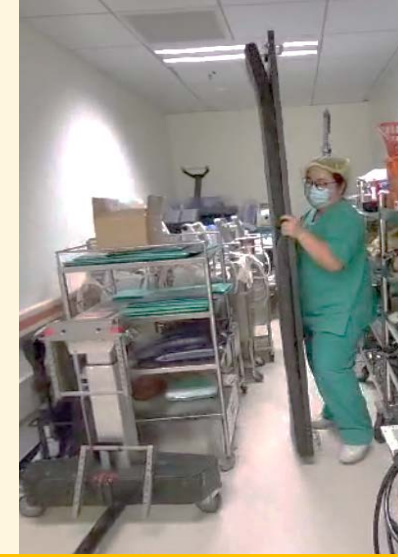


Original OSI table preparation process

 **Risky
work task 1**

**Factory rack is not
ergonomic friendly**

**Too heavy and bulky
item for MHO**



Lift and carry 55 lbs OSI table platform, tilt it from vertical to horizontal

 **Risky
work task 2**

Persistent exertion

Awkward posture



Hold the platform manually while connecting to two ends of OSI table framework

Average
preparation
time: 16 min

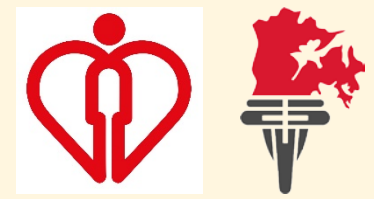


Original OSI table preparation process

How do you feel about the procedure?

Uneasy, but this is what I can do for patients, no alternatives !





Original OSI table preparation process

Risk assessment

- Ergonomic assessment tool: Rapid Entire Body Assessment (REBA)
- Ergonomic risk is classified as **“very high”**

REBA Employee Assessment Worksheet

based on Technical note: Rapid Entire Body Assessment (REBA), Hignett, McAtamney, Applied Ergonomics 31 (2000) 201-205

A. Neck, Trunk and Leg Analysis

Step 1: Locate Neck Position

+1 (left) +2 (right) +2 (extension)

Step 1a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Neck Score

Step 2: Locate Trunk Position

+1 (left) +2 (right) +3 (extension) +4 (60°+)

Step 2a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Trunk Score

Step 3: Legs

+1 (left) +2 (right) +3 (extension) +4 (60°+)

Step 3a: Adjust...
If leg is twisted: +1
If leg is side bending: +1

Leg Score

Step 4: Look-up Posture Score in Table A

Using values from steps 1-3 above, locate score in Table A

Posture Score A

Step 5: Add Force/Load Score

If load = 11 lbs: +0
If load 11 to 22 lbs: +1
If load = 22 lbs: +2
Adjust: If shock or rapid build up of force: add +1

Force/Load Score

Step 6: Score A, Find Row in Table C

Add values from steps 4 & 5 to obtain Score A.
Find Row in Table C.

Score A

Scoring:

1 = negligible risk
2 or 3 = low risk, change may be needed
4 to 7 = medium risk, further investigation, change soon
8 to 10 = high risk, investigate and implement change
11+ = very high risk, implement change

B. Arm and Wrist Analysis

Step 7: Locate Upper Arm Position:

+1 (left) +2 (right) +3 (extension) +4 (60°+)

Step 7a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Upper Arm Score

Step 8: Locate Lower Arm Position:

+1 (left) +2 (right) +3 (extension) +4 (60°+)

Step 8a: Adjust...
If wrist is bent from midline or twisted: Add +1

Lower Arm Score

Step 9: Locate Wrist Position:

+1 (left) +2 (right) +3 (extension) +4 (60°+)

Step 9a: Adjust...
If wrist is bent from midline or twisted: Add +1

Wrist Score

Step 10: Look-up Posture Score in Table B

Using values from steps 7-9 above, locate score in Table B

Posture Score B

Step 11: Add Coupling Score

Wall fitting Handle and mid range power grip: good: +0
Acceptable but not ideal hand hold or coupling: fair: +1
Acceptable with another body part: poor: +2
No handles, awkward, unsafe with any body part: Unacceptable: +3

Coupling Score

Step 12: Score B, Find Column in Table C

Add values from steps 10 & 11 to obtain Score B.
Score B. Find column in Table C and match with Score A in row from step 6 to obtain Table C Score.

Score B

Step 13: Activity Score

+1 1 or more body parts are held for longer than 1 minute (static)
+1 Repeated small range actions (more than 4x per minute)
+1 Action causes rapid large range changes in postures or unstable base

Activity Score

Table C Score + **Activity Score** = **Final REBA Score**

	Neck		
	1	2	3
Legs	1 2 3 4	1 2 3 4	1 2 3 4
Trunk Posture Score	1 2 3 4	1 2 3 4	1 2 3 4
Score A	1 2 3 4	1 2 3 4	1 2 3 4

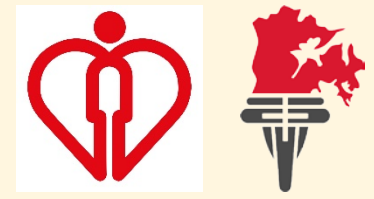
	Upper Arm	
	1	2
Wrist	1 2 3 4	1 2 3 4
Upper Arm Score	1 2 3 4	1 2 3 4
Score B	1 2 3 4	1 2 3 4

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	7	7	8	8
3	2	3	3	4	5	6	7	7	8	8	9	9
4	3	4	4	5	6	7	8	8	9	9	10	10
5	4	5	5	6	7	8	9	9	10	10	11	11
6	5	6	6	7	8	9	10	10	11	11	12	12
7	6	7	7	8	9	10	11	11	12	12	13	13
8	7	8	8	9	10	11	12	12	13	13	14	14
9	8	9	9	10	11	12	13	13	14	14	15	15
10	9	10	10	11	12	13	14	14	15	15	16	16
11	10	11	11	12	13	14	15	15	16	16	17	17
12	11	12	12	13	14	15	16	16	17	17	18	18



Objectives

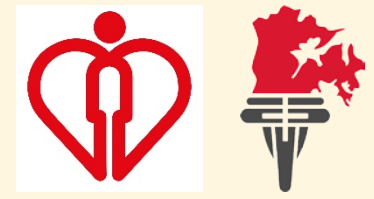
1. To improve occupational health of Orthopedic PCA
2. To streamline workflow, minimize MHO and enhance efficiency



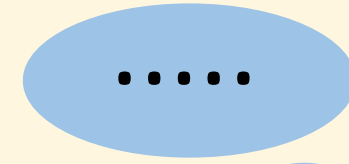
Team up!

- Engaging relevant stakeholders to form a focus group
 - OMCS
 - OSH
 - Operation Theatre
 - O&T
- Investigate risk level associated with the concerned procedure and identify potential improvement measures
 - Engage PCA and empower them to make the change together





Difficulties

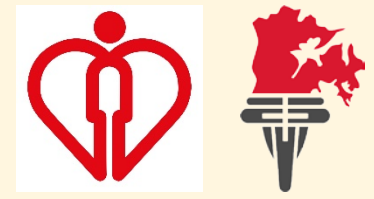


- Resistant to change
- Different opinions
- Mistrust
- MHO risk related to OSI table is not their 1st priority, because there is no way out



Not engaged





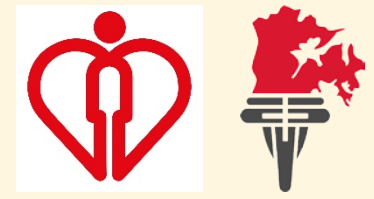
Staff engagement and empowerment

Listen to their concern and get them engaged in what they want to address first



Problem solving process on their concerned areas

- Enhance open / transparent communication
- Empower them contribute to improvement measures
- Care / building trust
- Recognize their input
- Ownership of the improvement
- Common goals to improve occupational health
- Give a good onboarding experience of success in OSH perspectives



Staff engagement and empowerment

Engaging PCA in OSI table preparation enhancement

1. Why we need to change

- MHO risk at high level
- Results of symptom survey:
 - 71% reported pain
 - 93% perceived hardship



VS



2. Benefits of the change

- Less MHO demand
- More efficient

3. Need their input for a feasible proposal

- Make decision making together

Paradigm shift

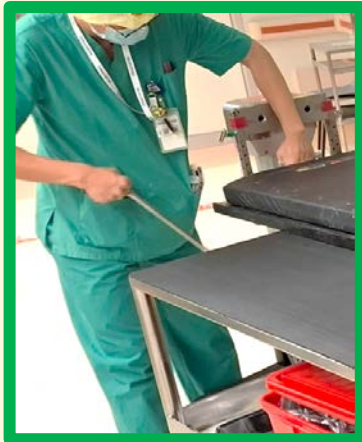
from detachment to connection
from desperation to motivation

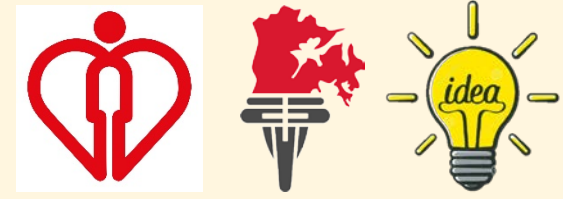
Engaged

Consensus on improvement measures

1. Invention of an OSI table equipment mobile cabinet

- Keep table platform horizontally on top, push it to mount on OSI table framework for preparation, the mobile cabinet support it during the maneuver

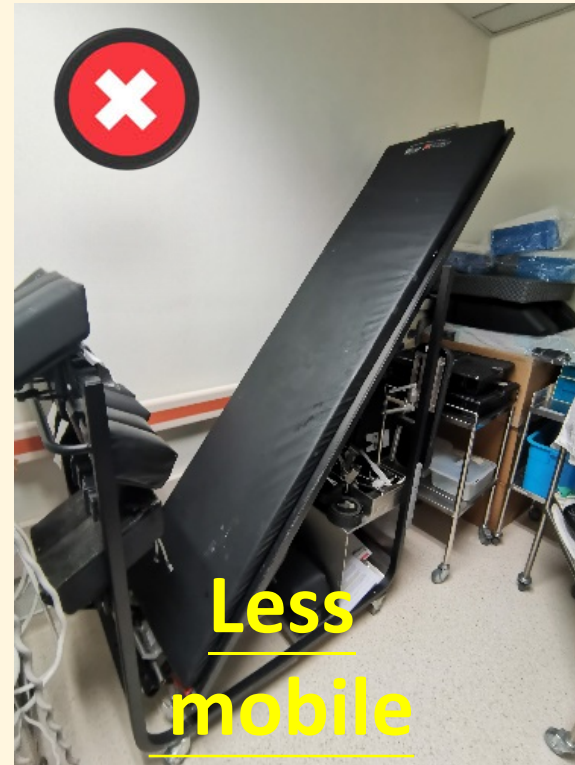




Consensus on improvement measures

2. Streamline workflow by facilitating more flexible table preparation location

- Tailormade mobile cabinet carry all the required OSI table accessories to theatre in one go
- More available peer support
- More spacious



3. Train the trainer: tailor-made MHO training had been provided to ensure skill transfers





Results and outcome



1. Enhance PCA's occupational health
2. Improve work efficiency

86% rated satisfactory or above with the new workflow

Reported pain 71% --> 14%
Average 4.6/10 --> 1.5/10

Average preparation time
dropped from 16 to 8.5 minutes

Perceived hardship 93% --> 28%
Average 7.3/10 --> 3/10

REBA ergonomic assessment score:
11 --> 3 (very high risk to low risk)

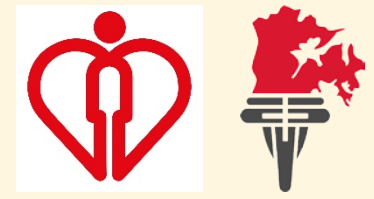


Recognition & reward



Conclusion





Way forward

- Advocate safe practice in OSI table preparation in NTEC
- Bring up to MHO committee (OSH, HAHO)
 - The concept in this project can be easily apply to other OT using OSI surgical table
 - Subject to local customization based on workflow and environmental factors



NEW Challenge



Care for the Carers



~ Thank you ~

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