

# Exoskeleton or arm holder:

## which equipment to limit musculoskeletal disorders among our pharmacy technicians?

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### Context



Common **musculoskeletal disorders (MSDs)** among hospital pharmacy technicians (HPT) in pharmacotechnics unit

Various **solutions** exist to **limit MSDs**:

- maximum reduction of volumes to be transferred,
- preparation aids,
- ergonomic chairs,
- robotization (but not adaptable to all production).....

...but MSDs can persist

Our preparation unit has been able to test 2 new ergonomic equipments designed to limit shoulder pain: an **exoskeleton** (ES) and an **arm holder** (AH).

### Methods

2 days of testing for each equipment



Survey

Scoring between 1 (⊗) and 4 (⊗)  
10 items grouped into 3 categories:

- **Setting up**
- **Mobility**
- **Pain relief**



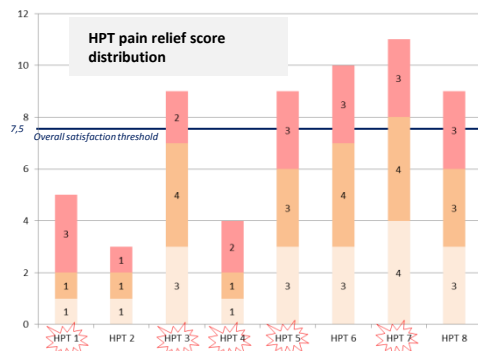
8 questions :  
- HPT (pain...)  
- type of preparations



Free field for comments

### Results

**Exoskeleton** tested by 8 HPTs, 5 of whom had pre-existing pain  
4 shoulder pain, 1 shoulder and back pain



median score/4

2,3

2,4

3

Setting up

- Ease to fitting
- Adjustment
- Removal

Mobility

- Weight
- Comfort
- Movement fluidity
- Accessibility to all isolator areas

Pain relief

- Shoulder pain relief
- Back pain relief
- Lumbar pain relief

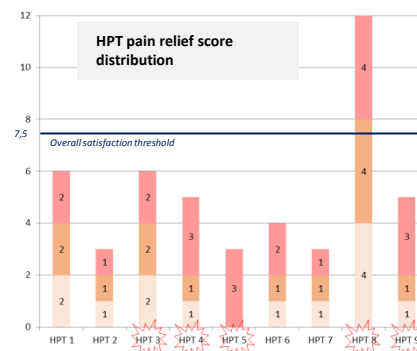
**Arm holder** tested by 9 HPTs, 5 of whom had pre-existing pain : 3 shoulders pain, 2 back pain

median score /4

3

2,3

1,7



Relieving back and lumbar pain was not rated by HPT 5



Practical for serial preparations (irinotecan, oxaliplatin...);  
Relieves shoulder strain when handling **baskets** in the isolator



Does not facilitate filling infusors

ES frame prevents access to **containers** for our isolators



No particular comments on filling infusors



Setting up is easy  
« Comfortable »



Does not stay in place at elbow level and systematically rises to armpit level after arm extension in the isolator.

### Discussion/Conclusion

AH

The AH seems to be **easier to use** than the ES (setting up, adjustments, accessibility of isolator areas). However, it **does not meet expectations regarding shoulder pain relief**, especially as it does not stay in place, which makes it difficult to assess its effectiveness. Improvements are underway, as the arm holder manufacturer has taken our comments on board.

ES

The ES allows a **“straight back” posture** to be maintained, which relieves the upper back and lumbar vertebrae as well as the shoulders. Access to the various areas of the isolator could be facilitated by oval cuff supports.



Following these test results, our unit will be equipped with 2 ES.