

# Reducing Ergonomic Strain During Subcutaneous Monoclonal Antibody Administration

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## SIGNIFICANCE & BACKGROUND

In outpatient infusion treatment centers, subcutaneous monoclonal antibody injections can shorten chair time versus intravenous infusions but may increase nurse strain with manual syringe push and require continuous chairside presence. Infusion pumps and tubing-needle sets are being adopted to improve ergonomics and patient experience, but real-world data in community settings are limited.

## PURPOSE

To evaluate workflow, nurse experience, and optional patient-reported outcomes after implementing pump assisted or tubing-needle set assisted subcutaneous drug administration.

## INTERVENTIONS

A quality improvement pilot was conducted at four community infusion centers. Three implemented a mechanical syringe infusion pump; one changed from direct manual push with a syringe and needle only to manual push through a short needle set with tubing to increase distance between nurse and patient. For each injection, nurses completed a survey capturing preparation and infusion times, workload (1-5), physical strain with the new workflow and retrospectively for previous manual push (1-10), satisfaction (1-5), multitasking, and comments. If patients provided feedback to the nurse participants during training, nurses optionally recorded patient pain (1-10) and satisfaction (1-5).

## RESULTS

- Sixty-four injections were documented (pump sites n=44; needle-set site n=20)
- Median infusion duration was 5 minutes in both groups

### At pump sites:

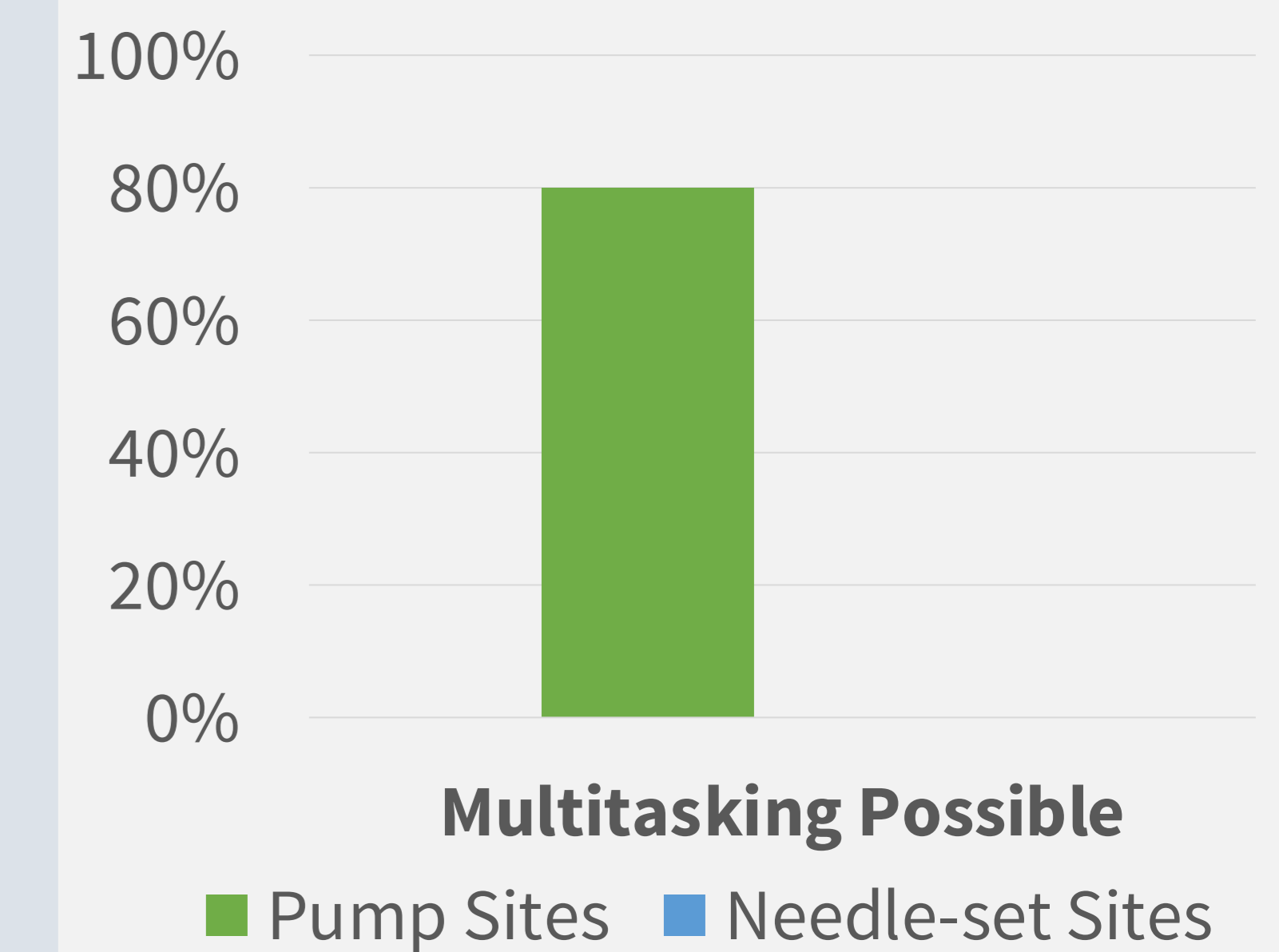
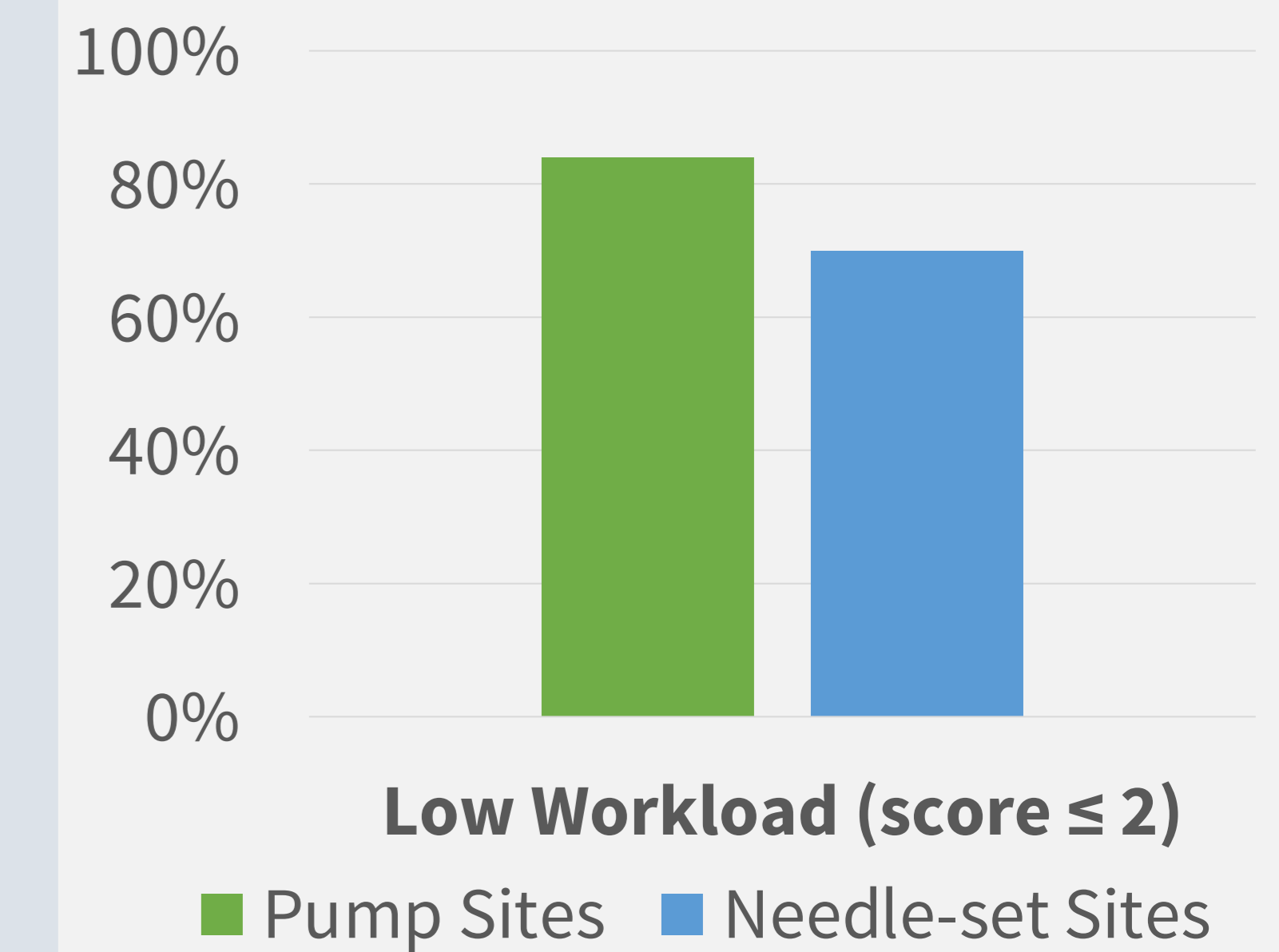
- Nurse workload was low (mean 1.7/5; 84%  $\leq 2$ )
- Physical strain decreased from 3.0 to 1.0 (on a 1-10 scale versus previous manual push)
- In all paired ratings (n=43), strain with the pump was equal to or less than prior practice (mean reduction 2 points)

### At the tubing-needle set site:

- Workload remained low (mean 1.9/5; 80%  $\leq 2$ )
- Strain decreased from 4.6 to 1.3/10 (mean reduction 3.3 points), with all nurses reporting equal or lower strain

### Across sites:

- Median pain was 1-1.5/10 with more than 80% of respondents reporting scores  $\leq 2$
- Mean satisfaction was 4.4-4.5/5 with at least 88% scoring 4 or 5
- Nurses reported being able to multitask during 80% of pump injections versus 15% while using the needle set alone
- Optional patient feedback was available for 62 injections (pain) and 61 (satisfaction)



## DISCUSSION

Both pump-assisted and extension-tubing subcutaneous drug administration were feasible and associated with low nurse workload and strain and high satisfaction. Pumps offered greater opportunity for multitasking, whereas tubing-needle sets reduced strain. These ergonomic approaches may support nurse musculoskeletal health and workflow flexibility; future work should evaluate longer-term outcomes and comparative efficiency.