“Surviving the Dip” after Subacromial Balloon Spacer Implantation for Massive Rotator Cuff Tear Treatment: A Retrospective Case Series

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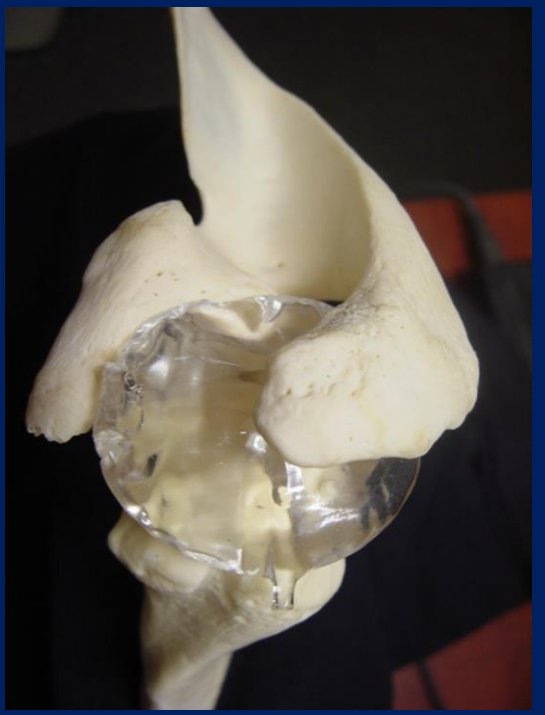
Objective

- Subacromial balloon spacer implantation (SBSI) attempts to decrease glenohumeral joint (GHJ) pain and improve function in patients with an irreparable rotator cuff tear (RCT) and minimal osteoarthritis.

- A previous study found that gradual implant resorption from 12-26 weeks post-SBSI may create a “balloon dip” that decreases GHJ function and increases pain. This retrospective cohort study attempted to delineate shoulder function, active mobility, strength, pain, and specific functional task impairment during this “balloon dip” period in relation to key rehabilitation phases.

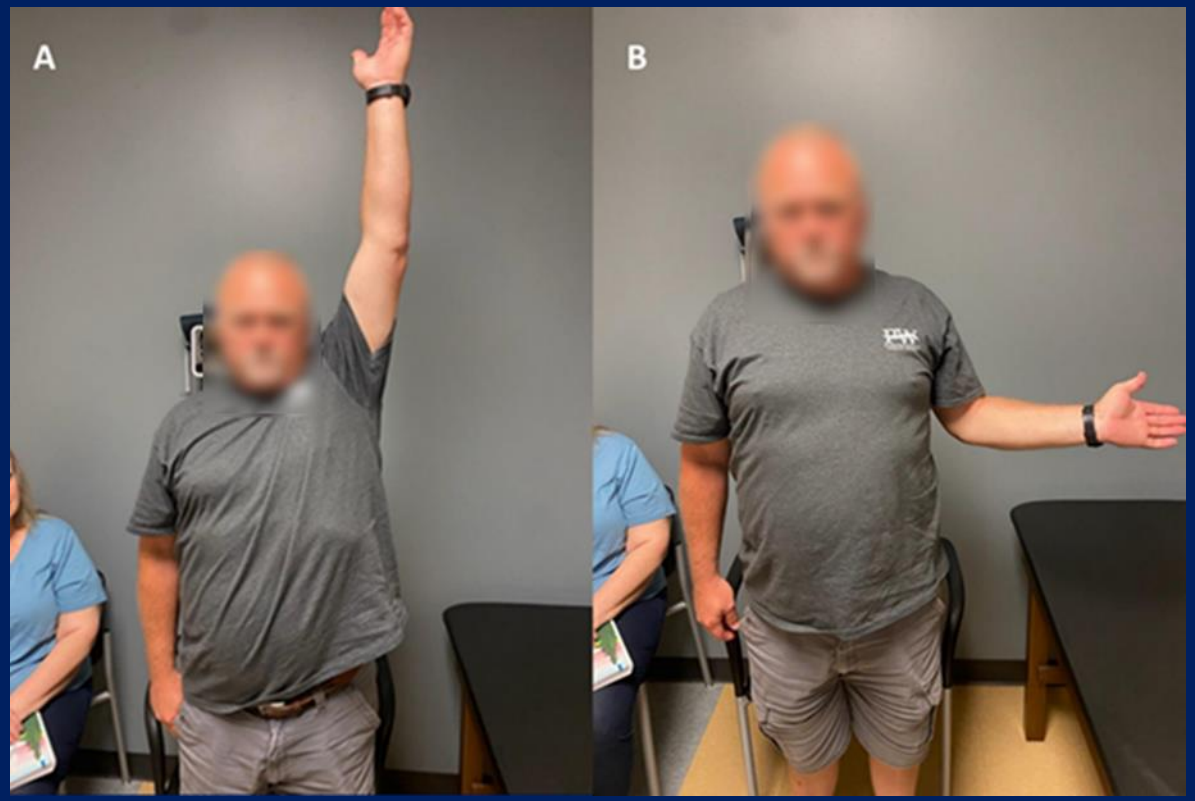
- Fares MY, Koa J, Singh J, Abboud JA (2024) The "Balloon Dip": Insights into a Post-operative Trend in Patients Undergoing Subacromial Balloon Procedure. J Orthop Case Rep 14(3):146-151.



Materials and Methods

Sixty-five consecutive patients (55.9 ± 7 years of age, 42 men) with an irreparable RCT underwent arthroscopic SBSI by a fellowship-trained shoulder surgeon.

Figure 1. 57 year old patient 24 weeks post-SBSI at left shoulder. (A) shoulder flexion; (B) shoulder external rotation in adduction.



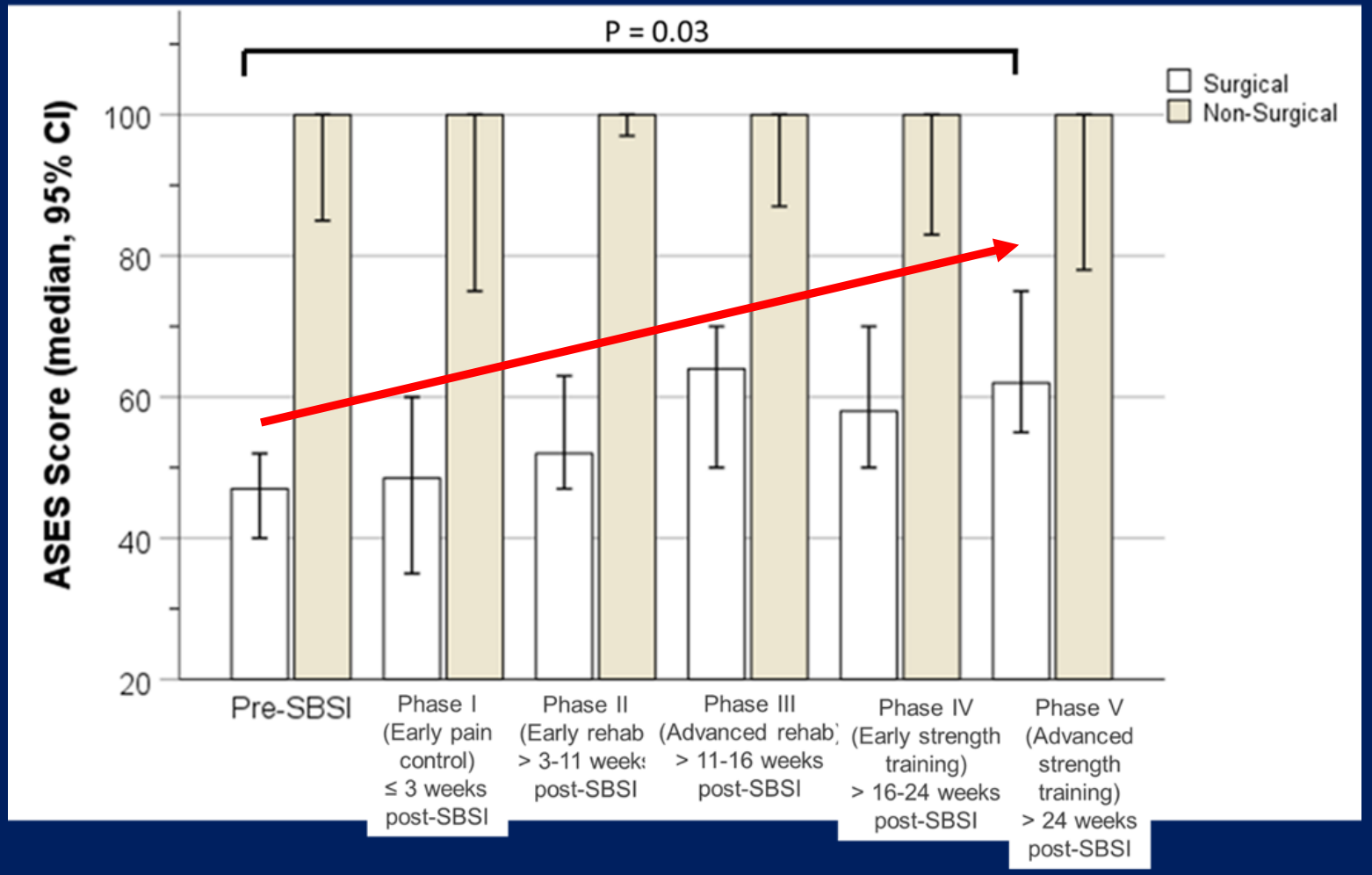
Materials and Methods

- Outcome measurements collected pre-SBSI and during Phase I-V included the American Shoulder and Elbow Society (ASES) score for perceived bilateral shoulder function, visual analog scale (VAS) surgical shoulder pain score, active mobility and shoulder manual muscle strength testing ($p \leq 0.05$).

Results

- Mean final follow-up time was 40 weeks post-SBSI (range = 24.1 to 89.7 weeks). The surgical shoulder had higher ASES scores at Phase V than pre-SBSI.

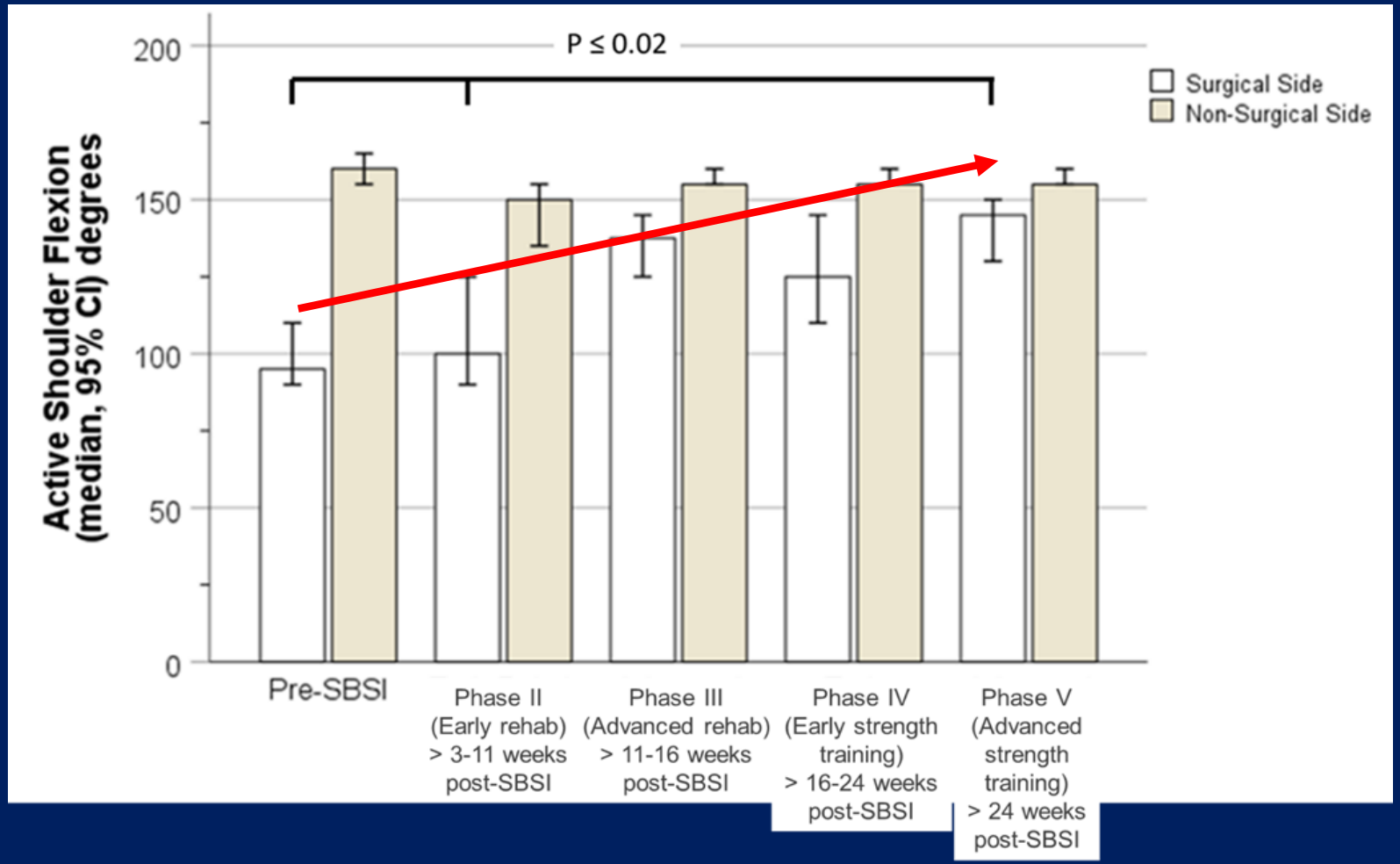
- Surgical shoulder pain was less during Phase V than pre-SBSI.



Results

- The surgical shoulder had greater flexion during Phase V than at Phase II or pre-SBSI, and greater external rotation (adducted) during Phases III-V than pre-SBSI.

- Peak shoulder internal rotation to level 12 (tip of extended thumb level with thoracic vertebra #10 spinous process) occurred during Phase V.



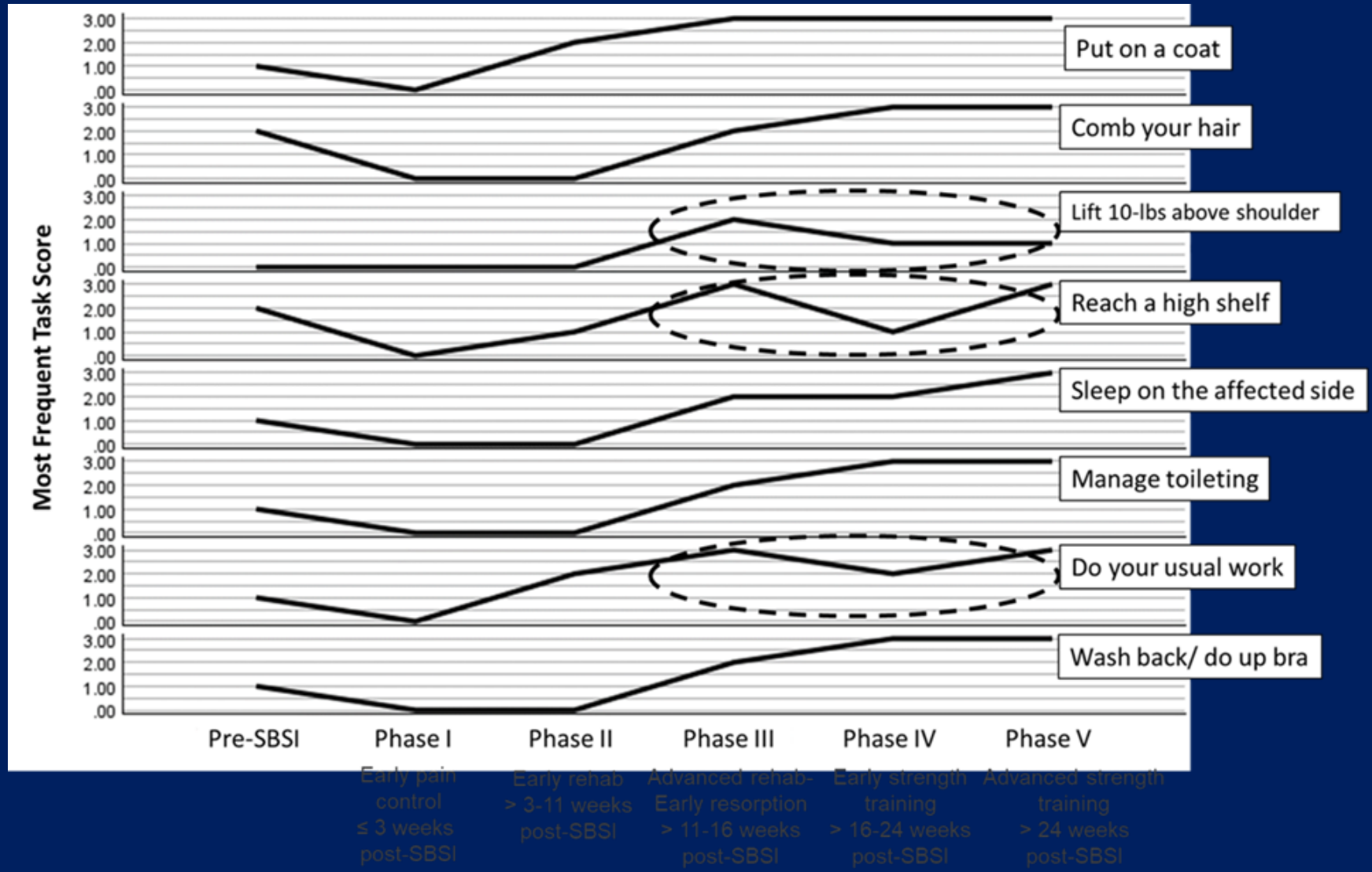
Results

- Peak flexor, external rotator (ER) and internal rotator (IR) strength occurred during Phase V.

	Pre-SBSI		Phase II (Early rehab > 3-11 weeks post-SBSI)		Phase III (Advanced rehab – early resorption > 11-16 weeks post-SBSI)		Phase IV (Early strength training > 16-24 weeks post-SBSI)		Phase V (Advanced strength training >24 weeks post-SBSI)		p-value	
	Surgical	Control	Surgical	Control	Surgical	Control	Surgical	Control	Surgical	Control	Side	Surgical Side Pairwise Comparisons
Flexion MMT	3* (3, 5)	5 (3, 5)	4* (3,4)	5 (3, 5)	4* (2,5)	5 (4, 5)	4* (3,5)	5 (4,5)	4* (3,5)	5 (4,5)	< 0.001	Phase V had the most 5 *(normal)*; Phases III and II had the most 4 *(good)*; Pre-SBSI had the most 3 *(fair)* ($p \leq 0.01$)
ER MMT	3* (3, 5)	5 (3, 5)	4 (3,4)	5 (3,5)	4 (3,5)	5 (4,5)	4 (2,4)	5 (4,5)	4* (3,5)	5 (4,5)	< 0.001	Phase V had the most 5 *(normal)*; Phase II had the most 4 *(good)*; Pre-SBSI had the most 3 *(fair)* ($p \leq 0.01$)
IR MMT	4 (3,5)	5 (4, 5)	4* (3,5)	5 (4,5)	4.5 (4,5)	5 (4,5)	5 (4,5)	5 (5, 5)	5* (4,5)	5 (5,5)	< 0.001	Phase V had most 5 *(normal)*; Phase II had most 4 *(good)* ($p \leq 0.01$)

Results

- During Phase I, most patients were unable to sleep on their surgical shoulder, wash their back/do up their bra, reach a high shelf, or lift 10-lbs overhead.
- Specific impaired functional tasks during the “balloon dip” period (between Phase III and V) were lifting 10-lbs overhead, reaching a high shelf, and doing normal work.
- By the end of Phase V, however, most patients could perform all tasks with minimal or no difficulty.



Conclusion

- Over the entire study, surgical shoulder function improved and pain decreased, however, during the “balloon dip” period the perceived ability to lift 10-lbs above shoulder level, to reach a high shelf, and to do usual work activities were the most impaired tasks.

- This information defines the “balloon dip” period providing the surgical and rehabilitation teams with the information needed to target these impairments and better counsel patients.

Thanks

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