

Beyond Protocols: Physiotherapy in Practice

Dolina Birchall*

Department of Physiotherapy, Trafford General Hospital, Manchester University NHS Foundation Trust, UK

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Corresponding author:

Dolina Birchall,
Department of Physiotherapy, Trafford General Hospital, Manchester University NHS Foundation Trust, UK,
Tel: +44 161 746 2525;
Email: dolina.birchall@mft.nhs.uk

ABSTRACT

Objectives: The primary aim was to evaluate post-operative physiotherapy delivery, and to assess average treatment session numbers and duration for a range of shoulder surgeries. Metrics to develop and implement a standardised physiotherapy process protocol were identified. This was a retrospective review in Secondary Care MSK Physiotherapy Departments, within a single NHS Trust.

Methods: 807 of 946 patients referred for post-operative physiotherapy within the Trust following elective shoulder surgery were included. Data about physiotherapy treatment duration, number of treatments, and non-attendances and cancellations post-ten most common shoulder surgeries were collected. Staff engagement survey and patient focus groups were conducted to identify areas for protocol development.

Results: 807 patients (mean age 55 years, range 14-89) were included. Duration of treatment was strongly positively correlated (Pearson correlation coefficient of 0.775) with the number of treatments. 385 (47.7%) patients completed their treatment within 100 days, but outliers were seen, including in the reverse TSA subgroup (range 1-649 days of treatment, IQR 94.5). Significant differences were seen in the number and duration of treatments when grouped according to procedure. There was no correlation between the duration of treatment and the number of DNAs, but there was a weak correlation between the duration and the number of cancellations by patients.

Conclusions: We have benchmarked average treatment physiotherapy sessions and duration of therapy across ten frequent shoulder surgeries. From this we developed and implemented a physiotherapy management protocol designed to reduce variation in therapy delivery while facilitating prompt identification of outlying patients.

INTRODUCTION

Successful rehabilitation is dependent on the interplay between clinical protocol, delivery process and clinical expertise, the latter two of which are subject to both operator and system-based variability. The processes by which a physiotherapy service is delivered may vary across site, department and specialty, but should aim to yield effective and high-quality therapy. Variation is also seen in the delivery of care by individual clinicians; this heterogeneity is related to variation in training, skill, clinical and personal experience, and local services among others [1]. Given the potential for such variation, clinical protocols provide a means by which to mitigate and reduce the effects this variation has on patient outcomes.

For post-operative patients requiring physiotherapy, clinical protocols should identify both expected goals, and the means by which to achieve these. Both functional and

time-based rehabilitation milestones should be set out. In the field of specialist shoulder surgery, there are multiple studies that have described specific protocols utilised, predominantly following rotator cuff repair [2-6], with a smaller number dedicated to shoulder arthroplasty [7-12]. To date, however, studies that have described the implementation of such protocols have predominantly focused on content, rather than implementation and related outcomes [13-15]. Lee et al, 2021, do highlight the importance of ongoing review of protocols, and describe the impact of their own observations and adaptations, as well as emerging evidence, on the evolution of their post-operative rehabilitation protocol.

We did not find any studies that focus on therapy input in terms of the expected number of physiotherapy appointments, or the duration the rehabilitation may be expected to take. Prolonged periods of rehabilitation may affect adherence to treatment, and as such it is important to be able to advise the patient of this as accurately as possible. Regardless of the particular surgery, authors advocate that successful rehabilitation is important in helping patients achieve the optimum clinical and quality of life outcomes [7,16].

While clinical protocols are useful tools for all clinicians involved in the delivery of therapy, consideration must be given to the process of care. i.e. management of any difficulties or deviation from protocol. In addition, it should be acknowledged that far from being rigid frameworks, a protocol should offer room for individualisation, and guidance should be available regarding how to offer this safely. Clinicians should feel competent to recognise those patients who struggle to progress to set milestones or, alternatively, reach the maximum potential of what a protocol defines. Less experienced clinicians should know where to seek guidance for these cases and feel supported when developing their own expertise. Developing a clinical protocol is only the first step in achieving favourable patient outcomes; successful implementation, as well as ongoing application of individual clinical expertise and experience in its use, are equally important [17,18].

AIM

The primary aim was to evaluate post-operative physiotherapy delivery, focusing on a group of patients undergoing shoulder surgery as a sample group. Analysis of data would be performed to determine average session numbers and duration

of post-operative physiotherapy for a range of shoulder surgeries. Qualitative data collected through patient focus groups and staff questionnaires would be analysed in an attempt to elicit any barriers to patient progression. Both qualitative and quantitative findings would form the foundation for the development and implementation of a standardised physiotherapy process protocol. This protocol would detail clear benchmarking of expected treatment duration, while maintaining emphasis on – and encouraging clinicians – to keep sight of the wider clinical picture, and apply their own clinical expertise as indicated. Most importantly, the protocol should be applicable and replicable irrespective of any variation in therapy delivery and clinical expertise. This pragmatic use of the protocol would facilitate prompt identification of outlying patients, ultimately increasing efficiency and effectiveness of the rehabilitation process.

METHODS

A multi-surgeon, retrospective review of therapy provision post-elective shoulder surgery of consecutive patients was carried out. The project was registered with the local clinical audit department. Patients having surgery who were then referred onto the local musculoskeletal physiotherapy service were included. Patients who received physiotherapy external to the trust or who did not attend any appointments were excluded. Therapy was delivered across five sites within a single trust. The ten most frequent surgeries were identified: arthroscopic rotator cuff repair; arthroscopic subacromial decompression (SAD); arthroscopic stabilisation; biceps tenodesis; biceps tenotomy; reverse total shoulder arthroplasty (RTSA); anatomic total shoulder arthroplasty (ATSA); revision total shoulder arthroplasty (rTSA); shoulder arthrolysis; acromioclavicular joint reconstruction (ACJR). Data collected included treatment duration (the total number of days between first physiotherapy review and point of discharge); number of treatments (the total number of therapy sessions a patient received); and non-attendances and cancellations.

Data analysis involved simple statistics, subgroup analysis, and multivariate analysis of variance (MANOVA) in order to identify any variation across surgery, site, and age. Data validation was performed by excluding patients who did not fall into one of the ten most common procedures, or who already had a specialised rehabilitation in place post-

operatively. To ensure data accuracy, data was reconfirmed by reviewing every twentieth sequential patient.

A staff engagement survey and patient focus group were held in order to identify any reasons for variation in treatment duration and patient progression. The staff engagement survey (Appendix 1) aimed to establish the confidence of clinicians in treating patients following elective shoulder surgery, and to identify areas for improvement. The patient focus group was preceded by a patient questionnaire (Appendix 2) and sought to explore patients' experience of physiotherapy and any ideas for service improvement.

RESULTS

The sample consisted of 946 patients referred for physiotherapy following elective shoulder surgery. 139 were excluded, leaving 807 for analysis.

The mean age of patients was 55 years, with a range of 14-89 years. Patients undergoing RTSA surgery had the highest mean age at 74.1 years. The youngest patients were those receiving arthroscopic stabilisation, with a mean age of 30.0 years. Age was not statistically significantly related to any of our outcomes. The most frequently performed surgery was arthroscopic rotator cuff repair, followed by arthroscopic SAD (Figure 1).

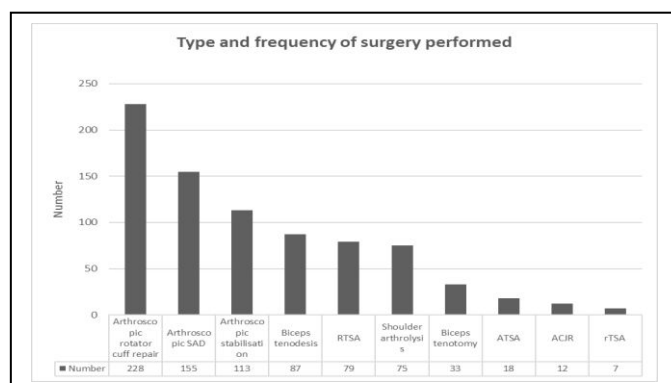


Figure 1. Type and frequency of shoulder surgery performed.

Across all surgeries, mean duration of treatment was 124.8 days. Significant differences were observed between groups ($p < 0.05$). The longest and shortest average durations of treatment were seen in the RTSA (147.6 days) and the ACJR (79.8) patients respectively. Wide ranges were seen within some groups; patients undergoing physiotherapy following arthroscopic rotator cuff repair were found to have the highest range of treatment duration (1-650 days). Figure 2 shows the

mean duration of treatment for all surgeries, as well as the range. Figure 4 shows duration of treatment plotted against number of treatment sessions required per surgery.

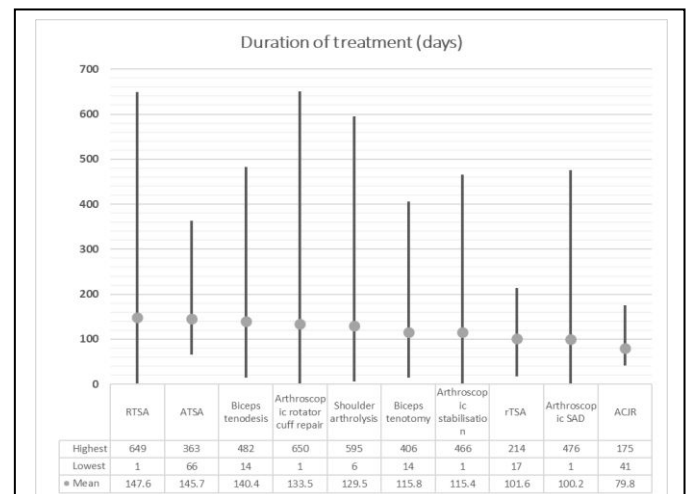


Figure 2. Mean and range of physiotherapy treatment duration in days, per shoulder surgery.

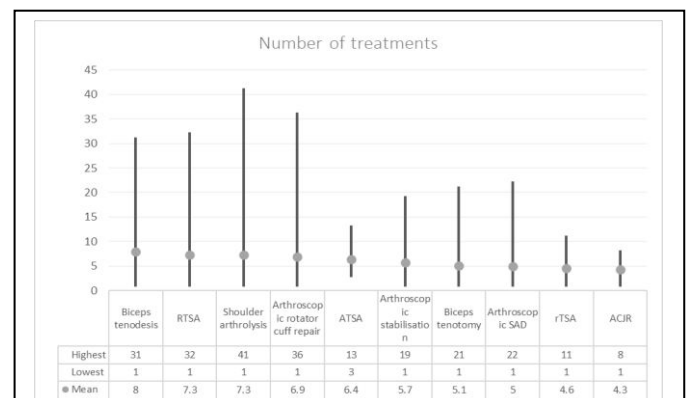


Figure 3. Mean and range of number of physiotherapy treatment sessions, per shoulder surgery.

The mean number of treatment sessions received across all surgeries was 6.4. In addition to having the shortest treatment duration, patients undergoing ACJR also received the fewest number of treatments, with an average of 4.3 sessions. The highest number was seen in the biceps tenodesis patients, at an average of eight sessions. Wide ranges of treatment numbers were observed, but the duration of treatment was strongly positively correlated with the number of treatments (Pearson correlation coefficient 0.775). Figure 3 shows the mean number of treatments and the range of treatments per surgery, and

Figure 4 shows treatment duration alongside number of treatments per surgery.

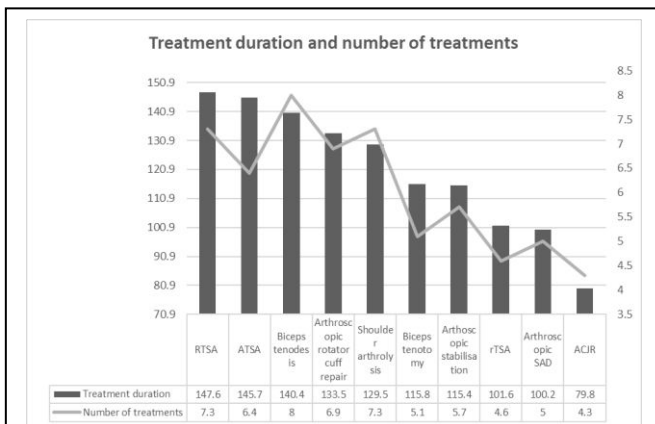


Figure 4. Physiotherapy treatment duration (days) alongside number of physiotherapy treatment sessions required, per shoulder surgery.

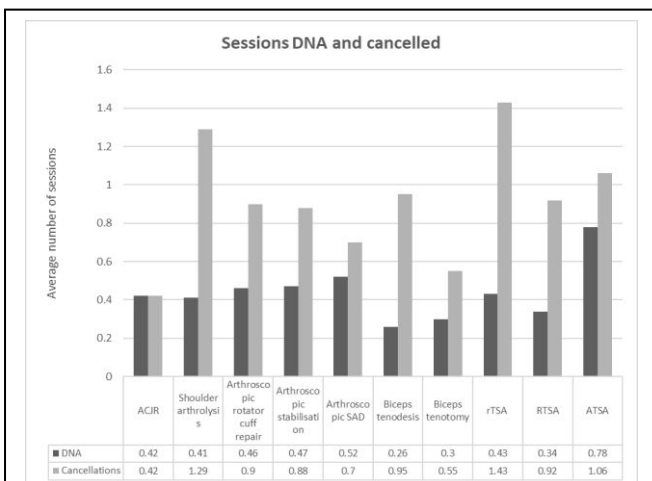


Figure 5. Physiotherapy appointment cancellations and non-attendances, per shoulder surgery.

Our study found no correlation between the duration of treatment and the number of sessions which were not attended by the patient without advanced notice (DNA). There was a weak correlation (Pearson correlation coefficient 0.318) between treatment duration and the number of sessions cancelled by patients in advance. The highest number of DNA was observed in patients who had undergone ATSA (0.78 sessions, range 0-3), while the highest number of cancellations was observed in the rTSA group (1.43, range 0-4) (Figure 5). Appointments were generally well attended.

Staff engagement exercise

The survey was distributed to 38 therapists, with a response rate of 92.1% (35/38). Over 80% of respondents indicated

that they felt confident in treating shoulders, with 5.7% (2/35) stating that they were not. Respondents felt that arthroplasty, closely followed by rotator cuff repair and arthroscopic stabilisation, were procedures that take longer to rehabilitate. 42.8% (15/35) of respondents (the largest cohort) felt they would seek advice if seeing limited improvement at four sessions. Most (88.6%, 31/35) would seek support from multiple sources for advice, however the most frequent source of this advice would be a senior physiotherapist. The preferred method of training and support was team training with (68.6%, 24/35) responses followed by physiotherapist grade and specific sessions (62.8%, 22/35). Three recurring themes suggested for improvements were treatment protocols, clinician education and setting realistic patient expectations following surgery.

Patient focus group

Forty patients were invited to attend the focus group. Ten accepted and were sent a pre-meeting questionnaire, with six patients (mean age 24 years, range 19-41) ultimately attending. Of the four patients who did not attend, three of these had previously attended only a single physiotherapy appointment. The fourth had attended five appointments. All four patients had been discharged from physiotherapy due to non-attendance.

With regards to employment, 50% of patients were in higher education at the time of surgery. One patient was a manual worker and was the only patient who had stopped working prior to surgery as a result of their shoulder problem. Most (66.7%) participated in heavy contact sport prior to surgery; only 40% were able to return to sport at the same standard. 100% of patients were satisfied with physiotherapy information supplied. All patients reported attending all of their therapy appointments, though one third stated that appointment times were not always suitable.

DISCUSSION

Evidence based practise in physiotherapy is commonly based on protocols that are drawn up based on best available evidence. It is known that guideline adhering physiotherapy can achieve the dual purpose of improving patient outcomes as well as reducing costs in healthcare [19]. It is also known that the application of evidence-based practise is inconsistent in its uptake amongst physiotherapy [20].

Following its development, implementation of a protocol remains a challenge. Different domains have been studied in order to improve implementation of protocols and guidelines. Features that could improve usage of protocols and guidelines include information about resource implications, instructions on local arrangements to promote and monitor guideline usage, as well as summaries and recommendations [20].

We have examined the utilisation of rehabilitation protocols for patients following shoulder surgery. Data was collected from 5 hospitals that were all part of the same NHS Trust following mergers. The aim was to review current practice, and the findings were intended to form the basis of standardised rehabilitation protocol for local implementation. Patient treatment number benchmarks have been identified that have aided the formation of an Elective Shoulder Surgery Therapy Protocol, that should improve staff adherence with existing post operative shoulder protocols. Data from both the survey of physiotherapy staff as well as from existing clinical practice, has been analysed to suggest an association between patient treatment numbers and clinical improvement. Failure to achieve the desired improvement within benchmarked number of treatment sessions should trigger actions such as discussing the case with more senior members of the team.

Our literature review failed to identify any existing literature that combines physiotherapy treatment numbers to clinical milestones. Physiotherapy is optimised when patients work in partnership with physiotherapists. In order to improve care, specific training with methods of delivery and protocol review where identified as changes that would improve services by the physiotherapy staff. These findings were similar to other authors, where staff also identified changes to improve services by changing the delivery process [21].

Variations in duration of therapy were seen across different hospital sites. This may reflect a difference in patient demographics, nature of surgery is performed by different surgeons as well as methods of physiotherapy delivery. Certain surgeries such as shoulder replacements also showed a trend towards requiring longer duration of physiotherapy with a higher number of treatments. This could be due to complex surgeries or could be due to clinical deconditioning [21-23] due to long waiting periods that are now commonplace in the NHS. Prehabilitation physiotherapy prior to elective surgery may be

considered in order to improve specific patient groups. These factors should be explored in future studies.

STRENGTHS AND LIMITATIONS

The strengths of this study are the large number of patients, generalisability, and repeatability, as the data is from a group perspective. This is a mixed quantitative and qualitative study and has attempted to interpret and enhance statistical findings from data with a human perspective only possible through qualitative means.

The limitations to be acknowledged are that this is retrospective study supported by qualitative data, therefore the conclusions are not hard facts, but nuanced suggestions.

The qualitative parts of the study have not been subject to statistical testing.

CONCLUSION

Clinical protocols should be based on real-world data and should complement local expertise and delivery process. Based on our data, it is possible to set benchmarks for the duration of therapy, and the number of sessions needed for therapy post-operatively and incorporate these into a clinical protocol. Such a protocol would enable earlier identification of patients failing to meet these targets and allow clinicians to offer appropriate support to these patients. However, without also taking into account variation in delivery process and clinical expertise, a protocol alone is unlikely to confer maximal benefit to patients. Effective training should result in clinicians who are able to use protocols effectively, while still providing individualised care. For those patients failing to progress along a protocol, early support should be sought, and efforts made to identify any barriers to progression. In our study, clinicians felt able to ask for help when needed and importantly, knew where to find this.

IMPLICATIONS FOR PHYSIOTHERAPY PRACTICE

- Study data illustrates the wide variation in post-operative physiotherapy requirements, both between different surgeries and between patients undergoing the same surgery.
- We have used this data to develop a physiotherapy management protocol; this protocol aims to provide a supportive and structured framework for post-operative physiotherapy, while simultaneously facilitating a more individualised approach to patient care.

- The study methodology and resulting protocol could be replicated across different orthopaedic specialties and different centres.

ETHICAL APPROVAL

Not Required

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CONFLICT OF INTEREST

None to declare.

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APPENDIX

1. Staff Engagement Survey

Management Of Shoulder Conditions - Staff Survey	
1. How confident are you in treating patients following shoulder surgery?	4. If a patient is struggling with ongoing pain / dysfunction and not meeting milestones- what are your strategies?
Extremely confident	
Somewhat confident	ad hoc question to peer
Neutral	ad hoc question to senior
Somewhat not confident	discuss at 1:1 session
Somewhat not confident	book joint pt appointment with senior
	refer directly back to clinic
2. Post Operative Shoulders- Is there any particular surgery that you feel takes longer to rehab? Please indicate in other section for any other procedures not listed.	do you email Consultant directly?
	do you discuss it with 8A
	Other
Cuff repair	5. Do you have access to the strategies listed in Q4 if you have a patient who is struggling? Please expand on what strategies you would like available in the other section.
Stabilisation	
Capsular release	
Biceps tenodesis	
Biceps tenotomy	Yes
AC Jt reconstruction	No
Shoulder replacement	Other
ASAD	
Other	
3. After how many treatment sessions do you consider that you may need further advice? Please provide further information below if applicable.	6. Upper Limb Training - How would you prefer the training to be delivered?
1-2 sessions	1:1 session
2-4 sessions	Group Session-i.e Band 5/6
	Outpatient Team Training
	Shadowing in department

4-5 sessions	Shadowing in clinic
6-7 sessions	Trust Wide Team Training
7-8 sessions	Webinar Training
More than 8 sessions	Other
Other	
	7. Do you have any suggestions that could improve the clinical management of shoulder patients?
	Open question answers

2. Patient Focus Group Questionnaire

1. Your age at surgery	7. Do you think physiotherapy played an important role in your recovery?
2. Your gender	Yes
Female	No
Male	
Prefer not to say	8. Did you attend all of your physiotherapy appointments? If no, can you give reasons in the 'other' section below:
Other:	
3. Did your shoulder stop you from working prior to surgery?	Yes
Yes	No (Please see Question 9)
No	
Sometimes	9. If the answer to the Question 8 is 'No', please can you explain the reason?
4. Did you participate in any sport before your surgery?	Appointment times were inconvenient
Heavy-contact sport i.e rugby	I knew the exercises to do
Non-contact sport	I didn't want to attend
Racket sport	I went to physiotherapy elsewhere
Other:	I didn't know I had to attend
	Too far to travel - inappropriate location
5. Post-surgery, have you been able to return to sport at the same standard?	Other:
Yes	10. What improvements can you suggest that would have improved your treatment before and after surgery from the physiotherapy service?
No	[Open question]

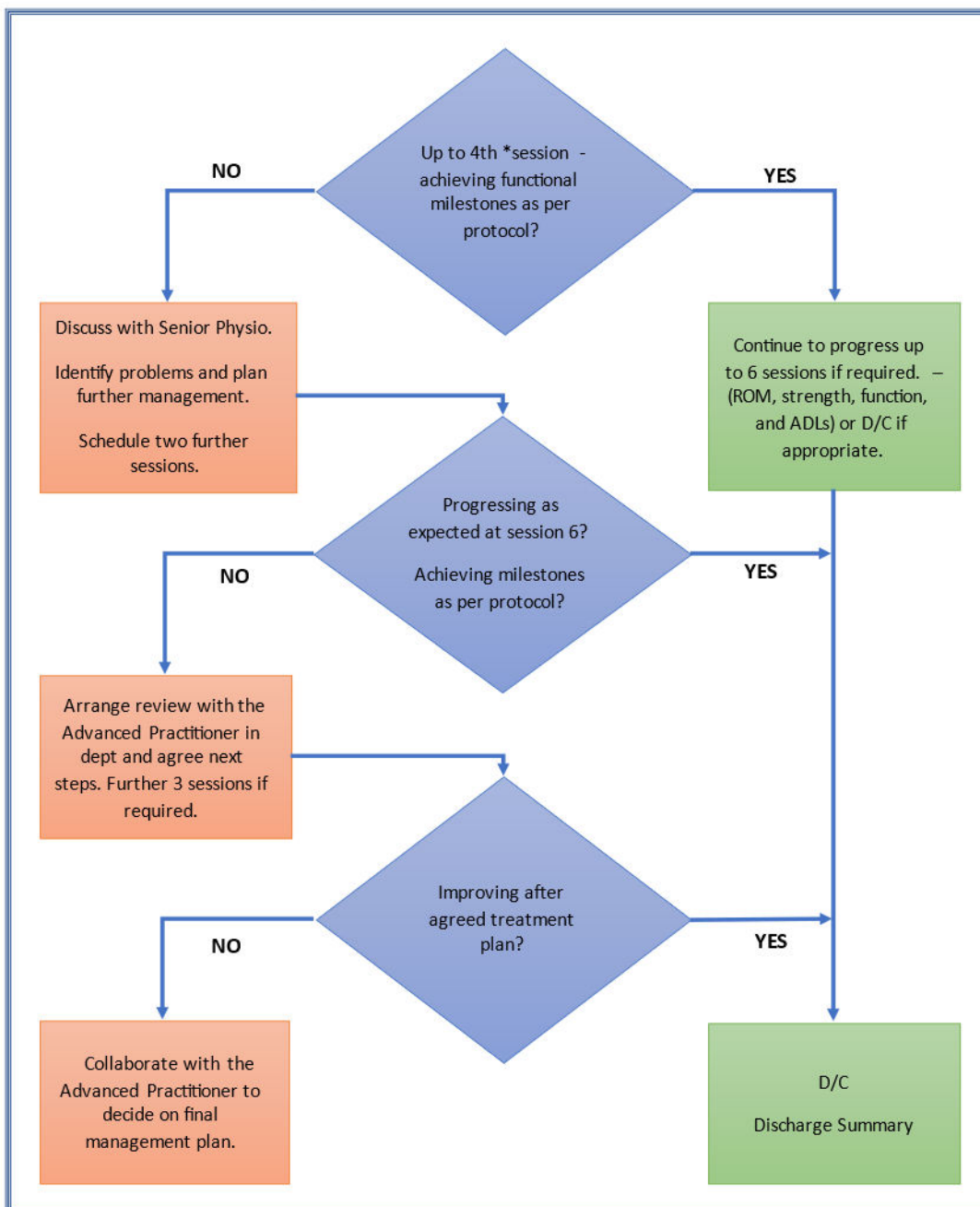
6. Were you given adequate information about
your physiotherapy post-surgery?

Yes

No

3. Elective Shoulder Surgery - Therapy Protocol

Elective Shoulder Surgery - Therapy Protocol	
Documentation	Review Operation note, Protocol, Clinic Letter, Record treatment number, Discharge Summary
Therapy Appointments	Assess and Progress, promote increase in function
Patient-Directed Rehabilitation	Increase ADLs as symptoms improve, target functional milestones, review patient expectations
Appointment Timing	Let pain settle. Schedule appointments based on individual needs.



NB – 4 & 6 sessions are treatment thresholds to trigger clinical reviews. These are, however, guidelines, and clinical judgement may mean escalation should occur earlier.