

# STARS Education and Research Alliance

CREATING KNOWLEDGE | TRANSFORMING CARE

## STARS Critically Appraised Topic (CAT) Group

### ALLIED HEALTH WEEKEND SERVICE PROVISION IN INPATIENT REHABILITATION



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

Metro North  
Health



Queensland  
Government

# STARS Critically Appraised Topic (CAT) Group: ALLIED HEALTH WEEKEND SERVICE PROVISION IN INPATIENT REHABILITATION

## Specific Question:

Which model of weekend service is optimal (reduces length of stay (LOS), optimises patient outcomes and leads to cost benefit) in an inpatient rehabilitation setting?

## Clinical bottom line

Offering an Allied Health inpatient weekend rehabilitation service provides better outcomes than no weekend service and providing a 6-day multidisciplinary service appears superior to offering a 7-day single disciplinary service.

**Why is this important?** STARS hospital has an Allied Health weekend service (AHWS) for rehabilitation inpatients, which is currently under review. The current weekend service at STARS consists of a 6-day Physiotherapy, Occupational Therapy and Speech Pathology service and a 7-day delegated Dietetic service, delivered by clinicians and clinical assistants, as well as an on-call weekend Social Work service. It is key that any changes to the service are informed by best evidence from research to ensure the service provided is based on the most up-to-date evidence. This CAT will inform the review of the STARS AHWS.

**Inclusion Criteria:** Weekend allied health rehabilitation services, adults, hospital inpatients, English language, humans, relevant study type (Meta analysis, Systematic reviews, RCT)

**Search dates:** Last 15 years (2008-2023)

**Type of Study:** Intervention

	Description	Search terms (see full search terms below)
<b>Population and Setting</b>	Patient population (stroke, traumatic brain injury, spinal cord injury, orthopaedic, reconditioning) Mixed inpatient rehabilitation	E.g., rehabilitation
<b>Intervention or Exposure</b>	Weekend service = 6- or 7-days	E.g., weekend, 6-day, 7-day, allied health
<b>Comparison, if any</b>	No weekend service (5-days)	-
<b>Outcomes of interest</b>	Clinical outcomes - LOS, quality of life, time to goal attainment. Service outcomes - discharge destination, hospital readmission, patient flow, adverse events, patient and staff satisfaction, indicators of staff burn out, cost savings	-
<b>Types of studies</b>	Meta analysis, Systematic reviews, RCT	systematic review, meta-analysis, randomised

LOS: length of stay; RCT: randomised controlled trials

Table 1. PICOT search plan

## Evaluation Measure

The tool used to critically appraise the articles selected was A Measurement Tool to Assess systematic Reviews (AMSTAR 2) (AMSTAR website: [https://amstar.ca/Amstar\\_Checklist.php](https://amstar.ca/Amstar_Checklist.php)). This instrument assesses methodological quality of systematic reviews and meta-analyses. It does not generate an overall score, however, takes into account specific domains such as adequate search criteria and strategy, risk of bias, funding source and conflicts of interest.

## Search Strategies

Databases Searched: PubMed, CINAHL Complete, Embase, Cochrane Library

Date of search: 21 February 2023

Search Engine	Number of results	Search Strategy
PubMed	99	("weekend"[ti] OR "weekends"[ti] OR "extended"[ti] OR "7 day"[ti] OR "seven day"[ti] OR "7 days"[ti] OR "seven days"[ti] OR "6 day"[ti] OR "six day"[ti] OR "6 days"[ti] OR "six days"[ti] OR "Saturday"[ti] OR "Sunday"[ti] OR "after hour"[ti] OR "after hours"[ti] OR "out of hour"[ti] OR "out of hours"[ti] OR "on call"[ti] OR "After-Hours Care"[Mesh]) AND ("Rehabilitation"[Mesh] OR "rehabilitation"[ti] OR "rehab"[ti] OR "allied health"[ti] OR "physiotherapy"[ti] OR "occupational therapy"[ti] OR "speech pathology"[ti]) AND (eng[la] OR und[la]) NOT (animals [mh] NOT humans [mh]) AND 2008:2023[dp] AND ("Controlled Clinical Trials as Topic"[Mesh] OR "Controlled Clinical Trial" [Publication Type] OR "Systematic Reviews as Topic"[Mesh] OR "Systematic Review" [Publication Type] OR "Meta-Analysis as Topic"[Mesh] OR "Meta-Analysis" [Publication Type] OR "randomized"[tiab] OR "randomised"[tiab] OR "randomly"[tiab] OR "trial"[tiab] OR "systematic review"[ti] OR "systematic reviews"[ti] OR "systematic literature review"[ti] OR "systematic scoping review"[ti] OR "systematic narrative review"[ti] OR "systematic evidence review"[ti] OR "systematic qualitative review"[ti] OR "systematic quantitative review"[ti] OR "systematic critical review"[ti] OR "systematic mixed studies review"[ti] OR "systematic mapping review"[ti] OR "Cochrane review"[ti] OR "Cochrane reviews"[ti] OR "systematic search and review"[ti] OR "systematic integrative review"[ti] OR "systematically"[tiab] OR "meta analysis"[ti] OR "meta analyses"[ti] OR "metanalysis"[ti] OR "metanalyses"[ti] OR "meta review"[ti] OR "meta reviews"[ti] OR "metareview"[ti] OR "metareviews"[ti] OR "umbrella review"[ti] OR "umbrella reviews"[ti] OR "rapid review"[ti] OR "rapid reviews"[ti])
CINAHL Complete (EBSCOhost)	102	(TI("weekend" OR "weekends" OR "extended" OR "7 day" OR "seven day" OR "7 days" OR "seven days" OR "6 day" OR "six day" OR "6 days" OR "six days" OR "Saturday" OR "Sunday" OR "after hour" OR "after hours" OR "out of hour" OR "out of hours" OR "on call")) AND (MH "Rehabilitation+" OR TI("rehabilitation" OR "rehab" OR "allied health" OR "physiotherapy" OR "occupational therapy" OR "speech pathology")) AND (LA English) NOT ((MH "Animals+" OR MH "Animal Studies" OR TI animal model) NOT MH "Human") AND (PY 2008-2023) AND (MH "Clinical Trials+" OR MH "Systematic Review" OR MH "Meta Analysis" OR TI("randomized" OR "randomised" OR "randomly" OR "trial" OR "systematic review" OR "systematic reviews" OR "systematic literature review" OR "systematic scoping review" OR "systematic narrative review" OR "systematic evidence review" OR "systematic qualitative review" OR "systematic quantitative review" OR "systematic critical review" OR "systematic mixed studies review" OR "systematic mapping review" OR "Cochrane review" OR "Cochrane reviews" OR "systematic search and review" OR "systematic integrative review" OR "systematically" OR "meta analysis" OR "meta analyses" OR "metanalysis" OR "metanalyses" OR "meta review" OR "meta reviews" OR "metareview" OR "metareviews" OR "umbrella review" OR "umbrella reviews" OR "rapid review" OR "rapid reviews") OR AB("randomized" OR "randomised" OR "randomly" OR "trial" OR "systematically"))
Embase (Elsevier)	170 (Limited to articles/articles in press/reviews due to high number of conference abstracts)	("weekend":ti OR "weekends":ti OR "extended":ti OR "7 day":ti OR "seven day":ti OR "7 days":ti OR "seven days":ti OR "6 day":ti OR "six day":ti OR "6 days":ti OR "six days":ti OR "Saturday":ti OR "Sunday":ti OR "after hour":ti OR "after hours":ti OR "out of hour":ti OR "out of hours":ti OR "on call":ti OR "out-of-hours care/exp) AND ('rehabilitation/exp OR "rehabilitation":ti OR "rehab":ti OR "allied health":ti OR "physiotherapy":ti OR "occupational therapy":ti OR "speech pathology":ti) AND [english]/lim NOT ('animal experiment'/de NOT ('human experiment'/de OR 'human'/de)) AND [2008-2023]/py AND ('controlled clinical trial (topic)/exp OR 'controlled clinical trial'/exp OR 'systematic review (topic)/exp OR 'systematic review'/exp OR 'meta analysis (topic)/exp OR 'meta analysis'/exp OR "randomized":ti,ab OR "randomised":ti,ab OR "randomly":ti,ab OR "trial":ti,ab OR "systematic review":ti OR "systematic reviews":ti OR "systematic literature review":ti OR "systematic scoping review":ti OR "systematic narrative review":ti OR "systematic evidence review":ti OR "systematic qualitative review":ti OR "systematic quantitative review":ti OR "systematic critical review":ti OR "systematic mixed studies review":ti OR "systematic mapping review":ti OR "Cochrane review":ti OR "Cochrane reviews":ti OR "systematic search and review":ti OR "systematic integrative review":ti OR "systematically":ti,ab OR "meta analysis":ti OR "meta analyses":ti OR "metanalysis":ti OR "metanalyses":ti OR "meta review":ti OR "meta reviews":ti OR "metareview":ti OR "metareviews":ti OR "umbrella review":ti OR "umbrella reviews":ti OR "rapid review":ti OR "rapid reviews":ti) AND ([article]/lim OR [article in press]/lim OR [review]/lim)
Cochrane Library (Wiley)	120 = 1 Cochrane Review, 119 Trials (Limited trials to year published 2008 – present)	#1 ("weekend" OR "weekends" OR "extended" OR "7 day" OR "seven day" OR "7 days" OR "seven days" OR "6 day" OR "six day" OR "6 days" OR "six days" OR "Saturday" OR "Sunday" OR "after hour" OR "after hours" OR "out of hour" OR "out of hours" OR "on call"):ti. Hits=7827 #2 MeSH descriptor: [After-Hours Care] explode all trees. Hits=43 #3 #1 OR #2.Hits=7845 #4 MeSH descriptor: [Rehabilitation] explode all trees. Hits=46438 #5 ("rehabilitation" OR "rehab" OR "allied health" OR "physiotherapy" OR "occupational therapy" OR "speech pathology"):ti. Hits=20776 #6 #4 OR #5. Hits=63052 #7 #3 AND #6 with Cochrane Library publication date from Jan 2008 to present. Hits=128

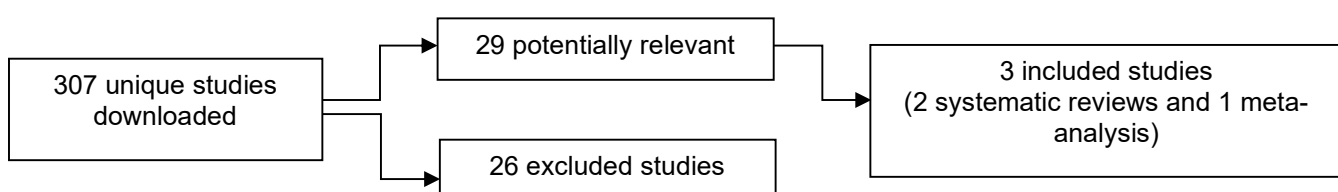
Table 2. Search Strategies

### Search process

Exported results from databases to EndNote, removed duplicates using the SR Accelerator Deduplicator tool (<https://sr-accelerator.com/#/deduplicator>). Also results not relevant to inclusion criteria to identify potentially relevant studies.

Copied annotated bibliography for potentially relevant results into word for screening title and abstracts, and highlighted results with relevant study types.

### Results total number of results from database searches = 491, deduplicated number of results = 307



Author, year, type of study	Population and setting	Intervention tested	Study results	Assessment of quality and comments
Sarkies, et al. (2018)  Systematic review and meta-analysis	Inpatients on general medical or surgical wards, or subacute rehabilitation hospital settings	AHWS versus 5-day Allied health service	Only <u>subacute results are reported</u> (eight RCTs and three cohort studies), as most relevant to STARS. <ul style="list-style-type: none"> <li>• Meta-analysis of three RCTs indicated AHWS reduced LOS by weighted mean difference of 2.35 days compared to 5-day allied health service</li> <li>• A trend towards improved function in activities of daily living, and health related quality of life with AHWS compared to 5-day allied health service</li> <li>• Cost savings found at 3- and 6-months post discharge with AHWS, compared to 5-day allied health service, however not at 12-months</li> <li>• No differences in hospital re-admission rates, adverse events or discharge destination with AHWS compared to 5-day allied health service</li> </ul>	When critiqued against AMSTAR 2, this study rated highly. Limitations included a lack of explanation for study designs selected, grey literature not searched, no discussion of assessment for confounding in non-randomised studies of intervention and no mention of investigation of publication bias and impact on results. The range of allied health disciplines involved, and subacute definition aligned with STARS. Outcomes investigated aligned with our question.
Scrivener, et al. (2015)  Systematic review	Adult inpatients in a subacute or rehabilitation setting	Weekend or after-hours therapy delivered by allied health therapists, nursing staff or family members, compared to 5-day allied health service	This systematic review included seven trials set in inpatient rehabilitation <ul style="list-style-type: none"> <li>• Significant improvement in balance and upper limb function with weekend or after-hours rehabilitation compared to 5-day allied health</li> <li>• A trend towards improvements in activities of daily living with weekend or after-hours rehabilitation compared to 5-day allied health service</li> <li>• Possibility of increased physical activity, increased steps taken, and time spent upright with weekend or after-hours rehabilitation compared to 5-day allied health service</li> <li>• No evidence of improvement in physical function, gait speed, LOS or increased risk of adverse events with weekend or after-hours rehabilitation compared to 5-day allied health service</li> </ul>	When critiqued against AMSTAR-2, this study did not rate as highly as the study above. It did not justify publication restrictions, provide a list or justification for excluded studies, account for risk of bias in studies when interpreting results or investigate publication bias. The outcomes investigated in this study answered our clinical question. The interventions included outside the current STARS weekend rehabilitation service – nursing-led, family-led and independent exercise programs.
English, et al. (2016)  Meta-analysis of individual patient data	Stroke population – moderate severity, who were able to mobilise independently prior to their stroke.  Inpatient rehabilitation	6-day physiotherapy and occupational therapy service vs 7-day physiotherapy service	Individual patient data meta-analysis of two trials with 350 participants. <ul style="list-style-type: none"> <li>• AHWS was an independent predictor for shorter LOS of 5.7 days compared to 5-day service in stroke populations (44.1 days vs 49.9 days), however this difference was not statistically significant</li> <li>• Providing 6-day Physiotherapy/Occupational Therapy resulted in a significant LOS reduction by 24 days compared to 7-day Physiotherapy (34.1 days vs 58.6 days) in stroke populations</li> <li>• Patients received approximately double the amount of Physiotherapy/Occupational Therapy on a Saturday, compared to Physiotherapy during a 7-day service</li> <li>• No difference was found in function, gait speed or health related quality of life when comparing usual care to AHWS provision in stroke populations</li> </ul>	When critiqued against AMSTAR 2, this study did not rate well. It did not contain an explicit statement of prior establishment of review methods, explain or justify deviations from prior agreed protocol, or assess risk of bias or publication bias in studies. As not a systematic review, several elements of AMSTAR 2 were not met, especially search details and study selection. The outcomes investigated answered question. The range of allied health disciplines are relevant to STARS. Compared 6-day (currently provided at STARS) to 7-day service, adopted by other similar hospitals.

AHWS: Allied Health weekend service; AMSTAR: A Measurement Tool to Assess systematic Reviews; LOS: length of stay; RCTs: randomised controlled trials.

Table 3: Summary of studies included in this review.

## Summary of Critical Appraisal

Of the three articles critically appraised, Sarkies et al 2018 was judged to be the highest level of evidence and best answered our clinical question. The range of allied health disciplines involved, and definition of 'subacute' fits best with the STARS rehabilitation setting. The outcomes investigated best matched our clinical question (see Table 3).

Key findings from Sarkies (2018) include:

- A significant reduction in LOS of 2.35 days with AHWS provision, which may positively impact patient flow.
- Weekend Physiotherapy/Occupational Therapy results in a trend towards improved physical function and quality of life compared to usual 5-day care. These benefits occurred over a shorter LOS.
- A mean cost saving was found at 3- and 6-months post-discharge, however was not present at 12-months.
- The studies investigated a mix of 6- and 7-day AHWS, therefore optimal service delivery model is unclear.
- No studies investigated the impact of a comprehensive multidisciplinary rehabilitation team on weekend service provision in the subacute setting, similar to that currently offered in STARS.

Key findings from the other selected articles include (see Table 3):

- Providing a 6-day Physiotherapy/Occupational Therapy service in stroke populations resulted in a significant reduction in LOS by 24 days, compared to a 7-day Physiotherapy only service (English, 2016).
- Stroke patients received approximately double the amount of weekend therapy with Physiotherapy/Occupational Therapy on a Saturday compared to Physiotherapy only on a Saturday and Sunday (English, 2016).
- Weekend therapy was found to be an independent predictor for shorter LOS (English, 2016).
- Weekend or after-hours rehabilitation demonstrated significant improvement in balance and upper limb function, with a trend towards improvements in activities of daily living and physical activity in a mixed adult inpatient sub-acute or rehabilitation setting (Scrivener, 2015).
- No difference was found in function, gait speed, or health related quality of life in stroke populations when comparing usual care to weekend allied health service provision (English, 2016), or in function, gait speed, LOS or increased risk of adverse events with weekend or afterhours rehabilitation in mixed populations (Scrivener, 2015).

## Implications for Practice/Research

Currently, there is no gold-standard of provision of AHWS, however it appears that offering a weekend rehabilitation service results in better outcomes than no weekend service, and that a Physiotherapy/Occupational Therapy weekend service on a single weekend day is superior to Physiotherapy weekend service provision on both weekend days, at least in stroke populations.

Given the results of this CAT, current STARS AHWS (a multidisciplinary 6-day service) is in line with best evidence.

There are, however, key gaps in the evidence base:

- The impact of other weekend Allied Health disciplines on patient outcomes, LOS and cost-effectiveness
- Which patients benefit most from AHWS and which patients benefit least
- The impact of different staffing models (hours, staff numbers, assistant ratio) on patient outcomes, LOS and cost-effectiveness
- The intensity of weekend rehabilitation service
- The specific content of weekend rehabilitation service.

## What would you tweet?

Offering an Allied Health inpatient weekend rehabilitation service provides better outcomes than no weekend service and providing a 6-day multidisciplinary service appears superior to offering a 7-day single disciplinary service.

## Critical Appraisal Topic Group Team Members

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- Dr. Annie Hill (Speech Pathology Conjoint, STARS Education and Research Alliance)
- Ben Hay and Raj Singh (STARS Physiotherapy)
- Giovanna Tornatore (STARS Occupational Therapy)
- Katherine Roxas (STARS Speech Pathology)
- Dr. Joseph Tam (STARS Geriatric Medicine)
- Dr. Sarah Anderson (STARS Rehabilitation Medicine)
- Dr. Niru Mahendran and Dr. Katrina Williams (Lecturers in Physiotherapy, The University of Queensland)
- Natalie Barker and Loretta Atkinson (Librarians, The University of Queensland)
- Dr Elizabeth Beadle (Psychology Conjoint, STARS Education and Research Alliance)
- Dr Susan Sullivan (STARS Education and Research Alliance Manager)

## References

Sarkies, M. N., et al. (2018). "Additional weekend allied health services reduce length of stay in subacute rehabilitation wards but their effectiveness and cost-effectiveness are unclear in acute general medical and surgical hospital wards: a systematic review." J Physiother 64(3): 142-158.

English, C., et al. (2016). "Additional weekend therapy may reduce length of rehabilitation stay after stroke: a meta-analysis of individual patient data." J Physiother 62(3): 124-129.

Scrivener, K., et al. (2015). "After-hours or weekend rehabilitation improves outcomes and increases physical activity but does not affect length of stay: a systematic review." J Physiother 61(2): 61-67.

A MeaSurement Tool to Assess systematic Reviews: [AMSTAR - Assessing the Methodological Quality of Systematic Reviews](#) and guidance document <https://amstar.ca/docs/AMSTAR 2-Guidance-document.pdf>