"Total Treatment Times (TTT) of Various Approaches to Contracture Management 2/7/95"

INTRODUCTION

Restoration of quality of live in a time efficient manner is a major concern of today's health care professionals. Patients desire a rapid return to a fully functional, healthy, active lifestyle. Industry and government are requesting more and more that the costs of rehabilitation along with the time lost from full functionality be minimized. Time has become a key issue in many aspects of the health care field.

Contracture rehabilitation is an area where recovery times are closely scrutinized. Therapists and physicians face increased pressure from patients, insurance carriers and employers to restore range of motion in a time efficient fashion. Many devices, orthoses and techniques exist that are designed to assist in the treatment of contractures [1-5]. The focus of this work is to present information regarding time efficiency with respect to the Total Treatment Time (TTT) of various contracture rehabilitation approaches. The TTT is the cumulative wear time which is an excellent measure of the amount of time a patient must invest in restoration of Range of Motion (ROM).

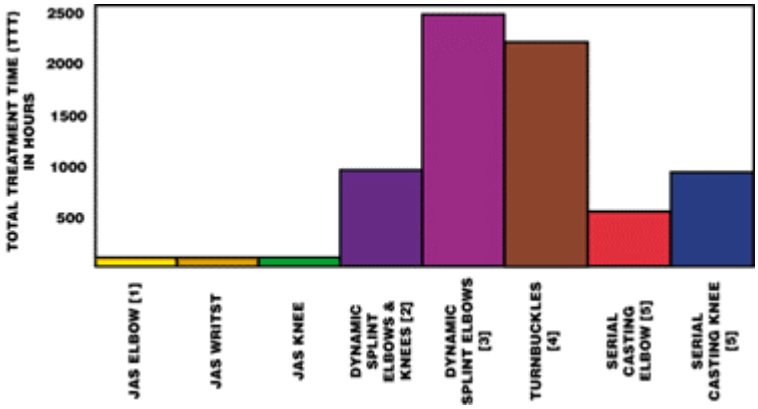
PROCEDURE

Data regarding the JAS elbow orthosis [1], dynamic splints (elbows and knees) [2. 3], turnbuckles (elbows) [4] and serial casting (elbows and knees) [5] were obtained from the literature. Independent occupational therapists, athletic trainers and physical therapists provided JAS wrist and knee results.

RESULTS AND DISCUSSION

Figure 1 contains the TTT results for the various types of contracture rehabilitation approaches explored in this work. Appendix A of this presentation contains the calculations for determining all of the TTT's reported here. Note how low the JAS TTT's are when compared to the dynamic splint, turnbuckle and serial casting data.

FIGURE 1: TTT FOR VARIOUS CONTRACURE REHABILITATION METHODS



The amount of time a patient must spend employing a device or orthosis is a measure of the efficiency of that approach. Longer TTT's require more of the patients time and increase the level of inconvenience that the patient, therapist and physician must endure. The results presented in Figure 1 clearly show that the JAS wrist, elbow and knee orthoses are much more time efficient than the other approaches investigated here.

It is important to mention that the gains obtained with the JAS approach are permanent and substantial. Previous reports in the literature [1] have shown a 69% permanent increase in ROM. Thus the short TTT's do not reduce the magnitude of permanent ROM gains.

CONCLUSION

1. JAS based therapy is a time efficient approach to contracture rehabilitation.
2. The total treatment time (TTT) is dramatically reduced (as much as 37 times) when employing JAS as opposed to serial casting, dynamic splinting and turnbuckle based approaches.
3. JAS produces permanent gains in ROM [1]
4. The combination of minimized TTT and permanent gains [1] suggests that JAS based therapy is the optimal approach to time efficient contracture rehabilitation.

REFERENCES

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4. Green. D.P. and McCoy, H.: Turnbuckle orthotic correction of elbow-flexion contractures after acute injuries. JBJS 61:1092, 1979.
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APPENDIX A: TTT CALCULATIONS

JAS Wrist (4 patients)

Average Duration of Use = 6.5 Weeks
TTT Working 1 Direction
1st Week 1 tx/day (1/2 hr/tx) = 1/2hr/day
2ndWeek 2 tx/day (1/2 hr/tx) = 1 hr/day
3rd Week 3 tx/day (1/2 hr/tx) = 1.5hr/day
Additional 3.5 weeks with same treatment times as the 3rd week
TTT = (1/2hr/day)(7 days) + (1 hr/day)(7 days) + (1.5 hrs/day)
(7 days/week)(4.5 weeks)
TTT = 57.8 hours for 1 direction

JAS Knee (3 patients)

Average Duration of Use = 7.2 Weeks
TTT Working 1 Direction
1st Week 1 tx/day (1/2 hr/tx) = 1/2hr/day
2ndWeek 2 tx/day (1/2 hr/tx) = 1 hr/day
3rd Week 3 tx/day (1/2 hr/tx) = 1.5hr/day

Additional 4.2 weeks with same treatment times as the 3rd week
TTT = (1/2hr/day)(7 days) + (1 hr/day)(7 days) + (1.5 hrs/day)
(7 days/week)(5.2 weeks)
TTT = 65.1 hours for 1 direction

Dynamic Splints Elbows and Knees [2] (13 patients)

Average Duration of Use = 13 Weeks ñ 91 days
Wear Time Varies From 8 to 12 Hours Per Day
TTT Working 1 Direction
(8hrs/day)(91 days) = 728 hours
(10hrs/day)(91 days) = 910 hours
(11hrs/day)(91 days) = 1001 hours
12 hrs/day)(91 days) = 1092 hours

Dynamic Splint Elbow [3] (1 patient)

Duration of Use = 7.5 months = 30 weeks
Wear Time = 12 hours
TTT Working 1 Direction
TTT = (12hrs/day)(7days/week)(30 weeks) = 2520 hours

Turnbuckle Elbow [4] (12 patients)

Duration of Use = 20 weeks = 140 days
TTT Working 1 Direction (Assume 16 hrs/day wear)
TTT = (16hrs/day)(140 days) = 2240 hours

Serial Casting Elbows and Knees [5]

(31 Elbow and 23 Knee pateints)

Elbow Duration of Use = 22 days
Knee Duration of Use = 40 days
Elbow TTT = (22 days)(24hrs/day) = 528 hours
Knee TTT = (40 days)(24hrs/day) = 960 hours