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COMPUTERIZED UPPER AND LOWER EXTREMITY EVALUATION AND EXERCISE SYSTEM COMPLETE WITH COMPUTER (E-LINK)

HEALTH TECHNOLOGY ASSESSMENT SECTION

MEDICAL DEVELOPMENT DIVISION

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DISCLOSURE

The author of this report has no competing interest in this subject and the preparation of this report is totally funded by the Ministry of Health Malaysia.

EXECUTIVE SUMMARY

Introduction

Upper extremity injuries or disorders may involve the shoulder, elbow, wrist and hand

Technical features

E-link is a comprehensive range of products for computerized evaluation and exercise of upper and lower extremities. It comprised of several components namely E-link database, E-link exercise which cover a spectrum of rehabilitation needs and E-link evaluation which allows greater objectivity, accuracy, and speed of data collection and calculation of upper and lower extremity disorders.

Objective

To determine the safety, effectiveness and cost effectiveness of Computerized Upper And Lower Extremity Evaluation And Exercise System Complete With Computer (E-Link) for upper and lower extremities disorders.

Methods

Literature were searched through electronic databases which included Medline via Ovid, PubMed, Cochrane Library, and general databases such as Google and Yahoo. Key words used include E-link OR "Computerized upper and lower extremity evaluation and exercise system", effectiveness OR efficacy, safety OR safe OR "adverse effect*" OR "harm* effect*", "cost effectiveness" OR "cost analysis" OR econom*. There was no limitation in the search.

Results and conclusion

There was no evidence retrieved on safety, effectiveness and cost-effectiveness of E-link

Recommendation

E-link is not recommended to be used for evaluation and exercise of upper and lower extremities disorder/injuries until more evidence obtained.

COMPUTERIZED UPPER AND LOWER EXTREMITY EVALUATION AND EXERCISE SYSTEM COMPLETE WITH COMPUTER (E-LINK)

1. INTRODUCTION

Upper extremity injuries or disorders may involve the shoulder, elbow, wrist and hand. Hand injuries are common and account for 5-10% of emergency department (ED) visits.[1] Other common injuries or disorders of upper extremity include rotator cuff pathologies, lateral epicondylitis and carpal tunnel syndrome.

Lower extremity injuries and disorders are also very common especially in sport activities and road traffic accidents. These injuries can affect the entire leg, or just the foot, ankle, knee, or hip.

The recommended intervention of rotator cuff pathologies include exercise program consisting of a mix supervised and home exercise programs focusing on stretching and strengthening of the shoulder, manual care for soft tissue mobilization and massage for increased mobility and pain management. As for lateral epicondylitis and carpal tunnel syndrome, the recommended treatment is exercise, ultrasound, manipulation and/or mobilization and acupuncture.[2]

An enduring problem in the field of rehabilitation has been the lack of standardization in the protocols of treatments and tests. Few computerized system has been developed to standardize the evaluation and exercise of the extremities.

This review was requested by the Rehabilitation Unit, Medical Services Development Section, Medical Development Division, following a request to procure shockwave therapy system for rehabilitation units in Ministry of Health Malaysia hospitals.

2. OBJECTIVES

To determine the safety, effectiveness and cost effectiveness of Computerized Upper And Lower Extremity Evaluation And Exercise System Complete With Computer (E-Link) for evaluation and exercise of upper and lower extremities disorders.

3. TECHNICAL FEATURES

E-LINK is a comprehensive range of products for computerized evaluation and exercise. It is said to be used worldwide in a variety of clinical settings such as physical therapy, lower and upper extremity rehabilitation, orthopaedics, sports medicine, independent medical evaluations, research, private practices, general rehabilitation, neuro rehabilitation, spinal injury units, stroke rehabilitation units, occupational therapy, hand clinics, pediatrics, burn and plastics, educational facilities and nursing homes.

Modules include electronic instrumentation for:

- Active exercise of the lower extremity, back, and neck
- Isometric pinch and grip strength measurements and
- Exercise
- EMG biofeedback and exercise
- Upper & lower extremity weight bearing exercise
- Range of Motion measurements

- Database software with automated data collection for fast, accurate measurements, documentation, statistical analysis, and progress reporting
- Automatic calculation of Upper Extremity Impairment using the American Medical Association (AMA) Guides to Permanent Impairment rev 4th and 5th editions and the Florida Uniform Permanent Impairment Rating Schedule

E-LINK Database Software can be used to create, store and retrieve patient records. It contains standard diagnosis list that can be modifiable by the user. It allows user defined fields where additional fields may be named and added to patient information, as well as some of the evaluation test screens. It allows standard text recognition; paste often used text or templates into note fields. The text may be created in the E-LINK software or pasted in from other applications. Data can be exported. Single or multiple patient data is exported as an ASCII file, and easily imported into other applications for statistical analysis. It facilitates outcomes reporting, or research studies. The reports can be generated comprehensively with graphics, table and text colour with user selectable parameters. The database has security features where multiple levels of users to restrict access to and protect the privacy of data collected.

E-LINK Exercise

The **E-LINK** parameters are set by the therapist, then the patient self exercises. The settings and results are saved in the patient's record where they can be viewed by the therapist and printed on the report. **E-LINK** accommodates a wide range of patients: from Paediatrics to Geriatrics, in both Orthopaedic and Neurological setting.

The **E-LINK** range of products and software for exercise cover the spectrum of rehabilitation needs which include active and active resistive exercise of the upper extremity, elbow & shoulder exercises, isometric pinch and grip exercises, EMG biofeedback and exercise and upper and lower extremity weight bearing exercise

E-LINK Evaluation

Computerized evaluation gives greater objectivity, accuracy, and speed of data collection and calculation of upper and lower extremity disorders. The E-LINK range of products and software for evaluation cover a variety of clinical applications from standard measurements done in almost all rehabilitation setting to comprehensive calculations done in specialized practices.

4. METHODOLOGY

4.1 SEARCH METHODS

Literature were searched through electronic databases which included Medline, Cochrane Library, Science Direct, Ebscohost and general databases such as Google and Yahoo.

The search strategy used the terms, which were either used singly or in various combinations: E-link OR "Computerized upper and lower extremity evaluation and exercise system", effectiveness OR efficacy, safety OR safe OR "adverse effect*" OR "harm* effect*", "cost effectiveness" OR "cost analysis" OR econom*. There was no limitation in the search.

4.2 SELECTION OF STUDIES INCLUDED /EXCLUDED

All primary papers, systematic reviews or meta-analysis pertaining to safety, effectiveness and cost effectiveness of E-link were included in this study.

Critical appraisal of all relevant literature was performed using Critical Appraisal Checklist Project (CASP) checklists and the evidence graded according to the US/Canadian Preventive Services Task Force Level of Evidence.

5. RESULTS AND DISCUSSION

5.1 SAFETY

There was no evidence retrieved on the safety of E-link. However, according to the manufacturer e-link products covered mentioned earlier have been independently certified to European Medical Electrical Safety Standard EN60601-1:1990, conform to the European Medical device Directive 93/42/EEC and have received CE mark.

5.2 EFFICACY/EFFECTIVENESS

There was no evidence retrieved on efficacy/effectiveness of E-link.

5.3 COST EFFECTIVENESS

There was no evidence retrieved on cost-effectiveness of E-link.

6. CONCLUSION

There was no evidence retrieved on safety, effectiveness and cost-effectiveness of E-link.

7. RECOMMENDATION

Based on the review, E-link is not recommended to be used for evaluation and exercise of upper and lower extremities disorder/injuries until more evidence obtained.

8. REFERENCES

1. Lese AB, Chuang KR, Decker W. Hand Injury, Soft Tissue. Retrieved on 3 April 2009 from http://emedicine.medscape.com/article/826498-overview.

2 . Upper Extremity Injuries. Workplace Safety and Insurance Board. Canada, 2005.