Guideline for Therapy Intervention for Radial Nerve Lesions and Neuropraxia

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

This guideline covers both the conservative and post-operative care of patients with a radial nerve lesion or neuropraxia of the radial nerve at forearm level, elbow level and proximal to elbow attending therapy departments in Worcestershire and Herefordshire.

This guideline is for use by the following staff groups:

Therapists who have undertaken a period of supervised practice in this field within the previous 2 years. Supervising/senior therapists to work towards British Association of Hand Therapists (BAHT accredited training at Level II in Elective, Trauma and Hand Therapy).

Lead Clinician(s)

An Van Hyfte	OT Clinical Specialist
Approved by Hand Therapy Clinical Governance on:	06th June 2024
Review Date: This is the most current document and is to be used until a revised version is available:	06th July 2027

Key amendments to this guideline

Date	Amendment	By:
15.07.10	Approved by the Hands Clinical Governance Group	
April 2012	No amendments made to guideline following review.	A Van Hyfte
July 2014	Document reviewed with no amendments made to content	A Van Hyfte
November 2016	Documents extended for 12 months as per TMC paper approved on 22nd July 2015	TMC
July 3rd 2017	Documents reviewed. Minor amendments to specify conservative and post-operative management	A Hinton
December 2017	Sentence added in at the request of the Coroner	
February 2019	Reviewed and approved with no content changes	An Van Hyfte
March 2021	Document extended for 6 months as per trust agreement 11.02.21	
June 2021	Document reviewed. Minor amendments made to 'competencies required' in order to include junior rotating therapists. Content of the guideline remains up to date and in line with latest research	An Van Hyfte
06th June 2024	Approved as accurate record. No amendments required.	An Van Hyfte

Guideline for Therapy Intervention for Radial Nerve Lesions

Introduction

This guideline covers the conservative management and post-operative care of patients presenting with a radial nerve lesion or neuropraxia of the radial nerve at forearm level, elbow level and proximal to elbow, attending therapy departments in Worcestershire and Herefordshire.

The radial nerve is most frequently damaged by fracture of the shaft of the humerus involving it in its spiral groove. It can also be affected by pressure in the axilla, which may affect triceps function. Injury at wrist level can cause damage to the posterior interosseus nerve and also to the sensory nerve where it passes superficially over the shaft of the radius, making it rather vulnerable.

When associated with extensor tendon repairs, the guideline for extensor tendon repairs should be followed.

Competencies required

- Therapists who have undertaken a period of supervised practice in this field within the previous two years.
- Junior therapists who have undertaken basic training in hand therapy should be supervised by an experienced therapist who has held a caseload in this area within the previous 2 years.
- Adherence to trust guidelines on wound management and infection control aseptic technique.

Patients covered

- Patients with damage to the radial nerve that will be managed conservatively
- The acute stage of this guideline covers patients with a radial nerve lesion not associated with extensor tendon repair.
- Any patient able to comply with the therapy regime following a repair to the radial nerve.

Details of guideline

For patients being treated conservatively or for those with a neuropraxia splinting and treatment suggestions include:

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- A wrist extension splint
- A volar forearm-based night resting splint in the position of safe immobilisation
- A low profile dynamic MCP extension splint (forearm-based if proximal to wrist and hand-based if only the posterior interosseus nerve is affected)
- Gradually reduce the wearing time of the splint or consider discarding sections of the dynamic splint as recovery occurs e.g. as wrist extension improves, discard wrist section

- For exercises and sensory re-education see week 3 onwards.

<table>
<tr><td>Time</td><td colspan="2"></td></tr>
<tr><td>Acute stage (week 1 to 3):</td><td colspan="2">
• <u>Splinting:</u>

○ The patient can be immobilised in the surgical backslab (position of safe immobilisation) for three weeks.
○ If required by the surgeon, this can be replaced by a forearm based, static, wrist extension splint (wrist in 0º-30º extension) leaving the digits free in the day time. If the repair is tight, the wrist may need to be immobilised in more extension. This should be discussed with the referring consultant.
○ In the latter case, a volar forearm-based resting splint should be fabricated to protect the repair in the position of safe immobilisation at night.
○ For high radial nerve injuries (proximal to elbow), also immobilise the elbow in mid position for 3 weeks

• <u>Exercises</u>:

Hourly active flexion and active-assisted extension of digits only

• <u>Oedema management:</u>

Patient is advised to position the forearm in elevation when sitting/sleeping using pillows.

• <u>Advice:</u>
The patient is advised not to use the affected hand for any activity i.e. work/ driving/lifting/housework.
The patient is advised to maintain range of movement of elbow/shoulder regularly.
Sutures should be removed 10-14 days post surgery. This can be done in the orthopaedic out-patient clinic or GP practice.
</td></tr>
<tr><td rowspan="3">Week 3:</td><td colspan="2"><u>Carry out a functional and sensory assessment of the upper limb:</u>
The following deficits can be expected with injury:</td></tr>
<tr><td>At forearm level
ECU
EDM, EI & EDC
AbdPL, EPB & EPL</td><td>Results in
Loss of ulnar wrist extension
Loss of MCP joint extension
Loss of thumb radial abduction & extension</td></tr>
<tr><td>At elbow level (see above plus)
Supinator
ECRL & ECRB</td><td>Results in
Weakened supination
Loss of ulnar and radial wrist extension</td></tr>
<tr><td></td><td>Proximal to elbow (see above plus)
Brachioradialis</td><td>Results in

Weakened elbow flexion</td></tr>
</table>

	<u>Splinting suggestions:</u> ○ At night → continue volar forearm-based night resting splint in position of safe immobilisation ○ In day → fabricate low profile dynamic MCP extension splint (forearm-based if proximal to wrist and hand-based if posterior interosseus only) ○ Light function within dynamic splint up to 6-8 weeks ○ Gradually reduce wearing time of the splint or consider discarding sections of the dynamic splint as recovery occurs e.g. as wrist extension improves, discard wrist section <u>Start gentle exercises out of splint:</u> ○ Maintain passive extension of long flexors (isolated and composite extension of fingers/wrist) ○ Active flexion of isolated joints (refrain from composite wrist and finger flexion till 8 weeks post op) ○ Active/passive thumb palmar & radial thumb abduction and thumb extension to maintain thumb web space ○ Monitor IP/MCP joint ROM and intrinsic muscle function which might be affected due to disuse ○ Commence nerve gliding exercises <u>Scar management:</u> To commence once the wound is closed (with no signs of infection). Scar massage is introduced using a non perfumed moisturiser. Patients are taught to use circular motions along the scar working distal to proximal to help the reduction of oedema. <u>Desensitisation/ sensory re-education:</u> Begin with localisation of moving touch using light and deep pressures over the involved area. When moving touch is perceived, upgrade to recognizing of shapes (starting with large objects and moving on to smaller objects) and discriminative sensation of different textures. Issue patient with Desensitising Programme information leaflet
Week 6 - onwards	<u>Splinting suggestions:</u> Continue dynamic extension splint or wrist extension splint/wrist brace to promote function. In case of a low lesion, where there is involvement of the posterior interosseus branch, a hand-based dynamic splint to assist digit extension is the preferred option. Each case must be assessed to determine the type of splint, depending on the level of injury and clinical signs. <u>Exercises:</u> ○ Include gentle passive ROM of wrist and digits can be introduced. If extensor tendons are associated,

	passive flexion should be delayed until 10 weeks post surgery! Important to maintain joint range by passive ROM and encourage active range within the splint. ○ Commence resisted exercises e.g. thera-putty strengthening programme. Need activities requiring a stable wrist /digit extension e.g. elevated activities
	Considerations Monitor for recovery and alter exercises and splint wear as necessary. Corrective procedures such as tendon transfer should be considered when there are no signs of nerve recovery after 12 months.

Monitoring Tool

Standards	%	Clinical Exceptions
All patients who have had radial nerve lesion.	100	Patients who are unable to safely follow the regime instructions e.g. those with cognitive impairment. Their treatment will be discussed on an individual basis with their consultant.

How will monitoring be carried out?	Continuous
When will monitoring be carried out?	As treatment occurs
Who will monitor compliance with the guideline?	Clinical Specialist Physiotherapist/ OT in Rheumatology/Hand trauma

References

- Salter M & Cheshire L (2000) Hand Therapy, Principles and Practice. Butterworth-Heinemann. Oxford
- Boscheinen-Morrin, J & Conolly, W.B (2001) The Hand. Fundamentals of Therapy 3rd edition. Butterworth-Heinemann. Oxford
- The Welsh Regional Centre for Burns & Plastic Surgery, Hand Therapy Guidelines (2008), Occupational & Physiotherapy Department. Swansea
- British Association of Hand Therapist – Trauma standards 2022, https://www.hand-therapy.co.uk

- Dahlin LB, Wiberg M. Nerve injuries of the upper extremity and hand. EFFORT Open Reviews. 2:158-170. 2017

- Novak CB, von der Hyde RL. Rehabilitation of the upper extremity following nerve and tendon reconstruction: when and how? Semin Plas Surg 29:73-80. 2015

Contribution List

Key individuals involved in developing the document

Name	Designation
An Van Hyfte	Clinical Specialist OT
Mandy Rawlings	Clinical specialist physiotherapist
Alison Hinton	Clinical specialist OT

Circulated to the following individuals for comments

Name	Designation
Miss Henning	Orthopaedic surgeon Worcestershire Acute Trust
Mr Simon	Orthopaedic surgeon Worcestershire Acute Trust
Physiotherapy Departments (outpatients)	WRH, Alex, Kidderminster
OT Departments (outpatients)	WRH, Alex, Kidderminster

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	***V***	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	**An Van Hyfte**

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
	An Van Hyfte	**Clinical specialist OT**	**a.vanhyfte@nhs.net**
Date assessment completed	**10/07/2024**		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	Title: **Guideline for Therapy Intervention for Radial Nerve Lesions and Neurapraxia**			
What is the aim, purpose and/or intended outcomes of this Activity?	This is an evidence based guideline for the rehabilitation of patients who have had a Radial Nerve Lesion and/ or Neurapraxia			
Who will be affected by the development & implementation of this activity?	❑ Service User ❑ Patient ❑ Carers ❑ Visitors		❑ Staff ❑ Communities ❑ Other _____ **V N/A**	
Is this:	**V** Review of an existing activity ❑ New activity ❑ Planning to withdraw or reduce a service, activity or presence?			

What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	We have compared our guideline with the practice of specialist hand therapy units in Queen Elisabeth Birmingham, UHCW, Pulvertaft centre Derbyshire and have revisited the exisiting literature available on the British Association of Hand Therapists (BAHT) website
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	Discussed with the main consultant and reviewed in the therapy clinical governance meeting held on 06/06/2024
Summary of relevant findings	Guideline is up to date

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age	V			
Disability	V			
Gender Reassignment	v			
Marriage & Civil Partnerships	v			
Pregnancy & Maternity	v			
Race including Traveling Communities	v			
Religion & Belief	v			
Sex	v			
Sexual Orientation	v			
Other Vulnerable and Disadvantaged	v			

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)				
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)	V			

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
	N/A	.		
How will you monitor these actions?	By regular audit of notes, observed practice (please see monitoring section of the document)			
When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)	**June 2027**			

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	An Van Hyfte 
Date signed	10/07/2024
Comments:	
Signature of person the Leader Person for this activity	
Date signed	
Comments:	

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	n/a

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval