

*Guidelines to be followed by centres, services and units in order to be designated as Reference Centres, Services and Units of the National Health System, as agreed by the Interterritorial Board*

**28. REPLANTATIONS, INCLUDING TRAUMATIC HAND INJURY**

**Replantation:** Restoring anatomic continuity of an amputated body part.

Mainly indicated for:

- Multiple digits amputation.
- Thumb amputation<sup>1</sup>.
- Hand amputation at palm or wrist<sup>2</sup>.
- Amputations in children<sup>3</sup>.

**Revascularization:** Re-establishing blood supply in an injured body part with severed blood vessels and, therefore, ischemic although maintaining some residual vascular bridge with the rest of the limb. This bridge may be formed by skin, tendons or bone, in isolation or jointly.

**A. Rationale for the proposal**

▶ Epidemiological data on the condition (incidence and prevalence).	5 cases susceptible to replantation and revascularization are estimated per million of active population per year <sup>4,5,6</sup> .		
▶ Data on replantation use <sup>7,8,9,10,11</sup> .	Available data: - Asturias: an average of 13 replantations and revascularization are performed in a year. - Cantabria: 4 replantations have been performed in 2006. - Andalusia: in a coverage area with a population of 8,000,000, the Replantation Unit of the Complejo Hospitalario Virgen del Rocío has assisted the following cases <sup>7</sup> :		
	Year	Emergencies assisted	Replantations / Revascularizations
	2000	36	12
	2001	51	12

	<b>2002</b>	<b>50</b>	<b>12</b>
	<b>2003</b>	<b>64</b>	<b>21</b>
	<b>2004</b>	<b>59</b>	<b>18</b>
	<b>2005</b>	<b>58</b>	<b>18</b>
	<b>2006</b>	<b>62</b>	<b>17</b>
	<b>TOTAL</b>	<b>380</b>	<b>110</b>

Extrapolating the data from Andalusia to Spain as a whole, there would be 90-100 replantations or revascularizations in a year.

***B. Guidelines to be followed by Centres, Services and Units in order to be designated as Reference Centres, Services and Units for performing replantations***

<p>► Experience of the Reference Centres, Services and Units:</p> <p>- Activity:</p> <ul style="list-style-type: none"> <li>• Number of procedures that should be performed in a year to ensure an adequate care.</li> <li>• Number of procedures that should be performed in a year of techniques, technologies and procedures similar to those specific to the designation requested.</li> </ul>	<ul style="list-style-type: none"> <li>- 40 to 60 emergencies per year (amputation alerts which may or may not be susceptible to replantation or revascularization)<sup>12</sup>. It is estimated that in 1 out of 4 emergencies a replantation is performed.</li> <li>- 15 to 20 replantations and revascularizations in a year.</li> <li>- A minimum of 30 procedures per year<sup>13</sup> of different microsurgical techniques (thumb reconstruction, club hand repair, cranial or peripheral nerve graft, digit-to-thumb transfer, microvascularized free flaps).</li> </ul>
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<p>- Other data: research on the subject, postgraduate teaching, continuing training, etc.</p>	<ul style="list-style-type: none"> <li>- Accredited postgraduate teaching<sup>16</sup>: unit participation in the internship and residency programme of the centre.</li> <li>- Participation in research projects<sup>17</sup> and publications in the field<sup>a</sup>.</li> <li>- Continuing training programme standardized, and authorized by the centre board of directors.</li> <li>- Programme of multidisciplinary clinical sessions at least once a month, in order to coordinate treatments.</li> </ul>
<p>► Specific resources of the Reference Centres, Services and Units:</p> <ul style="list-style-type: none"> <li>- Human resources required for the adequate performing of replantations.</li>   <li>- Basic education of the team members<sup>b</sup>.</li>   <li>- Specific equipment required for the adequate performing of replantations.</li> </ul>	<ul style="list-style-type: none"> <li>- Surgeon coordinating the team.</li> <li>- Multidisciplinary team with at least: <ul style="list-style-type: none"> <li>• 2 surgeons specialized in plastic, reconstructive and aesthetic surgery or in orthopaedics and trauma surgery.</li> <li>• 1 anaesthetist.</li> </ul> </li> <li>- Nursing staff, surgical auxiliaries and technicians.</li> <li>- Continuous care must be provided 24 hours a day, 365 days a year.</li>   <li>- Surgeons with 2 or more years of experience in reconstructive, vascular and nerve microsurgery<sup>15</sup>.</li> <li>- Nursing staff, surgical auxiliaries and technicians with experience as technicians in reconstructive microsurgical techniques and with specific training in treating replanted patients.</li>   <li>- Major surgery operating theatre available 24 hours a day, 365 days a year, with the required instruments and equipment for performing replantations: <ul style="list-style-type: none"> <li>• Microsurgery instruments, including surgical loupes and surgical microscope.</li> <li>• Orthopaedics and trauma surgery instruments.</li> <li>• Plastic surgery instruments.</li> <li>• Monitoring specific instruments: pulse oximeter, conventional doppler, laser doppler, others.</li> </ul> </li> </ul>

<p>► Resources from other units and services besides those belonging to the Reference Centres, Services and Units required for the adequate performing of replantations.</p>	<ul style="list-style-type: none"> <li>• Intraoperative diagnostic imaging devices.</li> <li>- Orthopaedics and trauma services/unit.</li> <li>- Plastic, reconstructive and aesthetic services/unit.</li> <li>- Angiology and vascular surgery services/unit.</li> <li>- Intensive care services/unit.</li> <li>- Rehabilitation services/unit, with experience in treating this type of pathologies<sup>14, b</sup>.</li> <li>- Cardiology services/unit.</li> <li>- Neurology services/unit.</li> <li>- Neurophysiology services/unit.</li> <li>- Nutrition and dietetics services/unit.</li> <li>- Infectious diseases services/unit.</li> <li>- Psychiatric services/unit.</li> <li>- Clinical psychology services/unit.</li> <li>- Laboratory services/unit.</li> <li>- Microbiology services/unit.</li> <li>- Social workers services/unit.</li> <li>- Animal facility and operating theatre for research available in the city where the reference centre, service or unit is for continuous training and learning microsurgical techniques.</li> </ul>
<p>► Procedure and clinical results indicators of the Reference Centres, Services and Units <sup>c</sup>:</p>	<p><b>The indicators will be agreed with the Units that will be designated.</b></p>
<p>► Existence of an adequate IT system (Type of data that the IT system must include to allow identification of the activity and evaluation of the quality of the services provided)</p>	<ul style="list-style-type: none"> <li>- Filling up the complete MBDS of hospital discharge.</li> <li>- The unit must have a <i>registry of patients</i> who have undergone an implant or revascularization which at least must include: <ul style="list-style-type: none"> <li>- Medical record number.</li> <li>- Date of birth.</li> <li>- Sex.</li> <li>- Admission date and time and discharge date.</li> <li>- Circumstances of the discharge (home, hospital transfer, voluntary, death, transfer to a healthcare centre, other.)</li> <li>- Accident date and cause.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>- Surgical procedure date and time.</li> <li>- Methods used to salvage the patient's amputated member.</li> <li>- Diagnostic procedures provided to the patient (ICD-9-CM):</li> <li>- Main diagnosis (ICD-9-CM). <ul style="list-style-type: none"> <li>• Injury site and characteristics.</li> </ul> </li> <li>- Number and type of therapeutic procedures provided to the patient (ICD-9-CM): <ul style="list-style-type: none"> <li>• Type of procedure used for replantation: <ul style="list-style-type: none"> <li>- Macro-replantation: For amputations proximal to the wrist joint.</li> <li>- Micro-replantation: For amputations distal from the wrist.</li> <li>- Distal replantation: For amputation distal from the proximal interphalangeal joint.</li> <li>- Complete amputation: total detachment of the injured segment.</li> <li>- Partial amputation: There is some connection between the injured segment and the limb without vascular continuity, which may be<sup>23</sup>: <ul style="list-style-type: none"> <li>Type I. Connected by the bone.</li> <li>Type II. Connected by the extensor tendon.</li> <li>Type III. Connected by the flexor tendon.</li> <li>Type IV. Connected by one nerve.</li> <li>Type V. Connected by the skin.</li> </ul> </li> </ul> </li> <li>If appropriate, reason why replantation or revascularization is not possible.</li> <li>• Other therapeutic procedures.</li> </ul> </li> <li>- Whether the replantation is viable or not.</li> <li>- Complications (ICD-9-CM): <ul style="list-style-type: none"> <li>• Total loss of the replant.</li> <li>• Partial loss of the replant.</li> <li>• Skin wound dehiscence.</li> <li>• Tenorrhaphy dehiscence.</li> <li>• Poor consolidation of the fracture.</li> <li>• Nervous complication of the amputation.</li> <li>• Surgical wound infection.</li> <li>• General complications associated to the surgical procedure.</li> </ul> </li> <li>- Follow-ups in doctor's office and operating theatre.</li> </ul>
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	- The unit must have the required data which should be sent to the Spanish National Health Service Reference Centres, Services and Units Appointment Commission Secretariat for yearly reference unit monitoring.
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<sup>a</sup> *Criteria to be assessed by the Appointment Commission.*

<sup>b</sup> *Experience will be accredited by certification from the hospital manager.*

<sup>c</sup> *Clinical results standards, agreed to by the experts group, will be assessed, initially by the Appointment Commission, while in the qualification process, as more information from the Reference Centres, Services and Units is being obtained. Once qualified by the Appointment Commission, the Quality Agency will authorize its compliance, as for the rest of guidelines.*

### **Bibliography:**

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