Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Health Technology Assessment of Scheduled Procedures

Surgery for Dupuytren's Contracture

December 2013

Safer Better Care

About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is the independent Authority established to drive continuous improvement in Ireland's health and personal social care services, monitor the safety and quality of these services and promote person-centred care for the benefit of the public.

The Authority's mandate to date extends across the quality and safety of the public, private (within its social care function) and voluntary sectors. Reporting to the Minister for Health and the Minister for Children and Youth Affairs, the Health Information and Quality Authority has statutory responsibility for:

- **Setting Standards for Health and Social Services** – Developing person-centred standards, based on evidence and best international practice, for those health and social care services in Ireland that by law are required to be regulated by the Authority.

- **Social Services Inspectorate** – Registering and inspecting residential centres for dependent people and inspecting children detention schools, foster care services and child protection services.

- **Monitoring Healthcare Quality and Safety** – Monitoring the quality and safety of health and personal social care services and investigating as necessary serious concerns about the health and welfare of people who use these services.

- **Health Technology Assessment** – Ensuring the best outcome for people who use our health services and best use of resources by evaluating the clinical and cost effectiveness of drugs, equipment, diagnostic techniques and health promotion activities.

- **Health Information** – Advising on the efficient and secure collection and sharing of health information, evaluating information resources and publishing information about the delivery and performance of Ireland's health and social care services.

Table of Contents

1 Surgery for Dupuytren's contracture

1.1 Scope of this health technology assessment

This health technology assessment (HTA) evaluates the appropriateness and potential impact of introducing clinical referral/treatment thresholds for surgery for Dupuytren's contracture. The effectiveness of this surgery may be limited unless undertaken within strict clinical criteria. This report is one of a series of HTAs of scheduled procedures. Details of the background to the request for the assessments from the Director General of the Health Service Executive (HSE), Mr Tony O'Brien, and the general methodology are included in the separate 'Background and Methods' document.[1]

The scope of this HTA is to recommend clinical referral and treatment thresholds to be used in the assessment, referral and surgical management of patients with Dupuytren's contracture for whom surgery is being considered. Input from an Expert Advisory Group, international guidelines, international policy documents and thresholds, and economic evaluations were reviewed to inform the referral criteria. Additionally, the resource and budget impact were assessed where appropriate.

1.2 Surgical indications

Dupuytren's disease is a fibrosing disorder of the palmar fascia, characterised by the appearance of firm pits, nodules or cords in the palm of the hand. This may extend to the fingers and cause them to flex inwards, in which case the disease is known as Dupuytren's contracture. The aetiology of the disease remains unknown, but the epidemiology has been extensively studied.[2-4] Dupuytren's disease is more common in men than women; the average age of onset is around 60 years. The disease is primarily seen in people of Northern European descent and is rare in African and Asian populations. In the UK, the overall incidence is around 4%, rising to 20% for those over 65 years;[5] 17% of cases involve bilateral disease.[6] Other risk factors that have been associated with the disease include alcohol, diabetes, epilepsy, smoking, HIV infection and trauma.[4] Rheumatoid arthritis has been associated with a lower incidence of Dupuytren's disease.[7]

Patients present with palmar or digital nodules or cords, which may or may not involve the skin. Contraction commonly occurs in the ring finger first, followed by the small finger, but the thumb and other fingers can also be affected. Contraction generally occurs over months to years and can lead to fixed contractures of the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints.[4] Unless

associated with acute palmar fasciitis or carpal tunnel syndrome, Dupuytren's disease is usually painless.[8]

Dupuytren's contracture can severely impact hand function, limiting quality of life and independence by preventing patients from carrying out routine work and home activities like dressing and washing.[9]

1.3 Surgical procedures, potential complications and alternative treatments

There is currently no cure for Dupuytren's disease. While many patients can be managed expectantly, treatment is indicated when function is affected or when the deformity is disabling.[9] Untreated contractures can become irreversible over time, so early intervention is important once these develop.

The aim of surgical treatment is to restore function and correct deformity with minimal complications.[9] Surgical approaches to treating the disease include fasciotomy, which involves simple division of a Dupuytren's cord either percutaneously or using open surgery, and fasciectomy, which is the excision of fascia from the affected area. The latter approach can involve the removal of diseased fascia only (limited or regional fasciectomy) or all fascia in the field of surgical clearance (radical fasciectomy). Where skin is involved in the disease process or is rendered non-viable through dissection, a full thickness graft can be used to cover the defect (dermofasciectomy).[8] Amputation or joint fusion may be indicated in severe cases with delayed presentation or recurrence.[10] Contraindications to surgery include skin problems such as infection or maceration, arthritis that is likely to be exacerbated by surgery, poor general health or inability to comply with the postoperative therapy regimen.[8] The overall complication rate is approximately 20% for fasciotomy and 24% for fasciectomy.[11] Complication rates for each type of surgery are shown in Table 1.1.

Table 1.1. Pooled estimates of surgical complication rates[11]

	Fasciectomy Mean % (range)	Fasciotomy Mean % (range)
Any	24 (12 – 46)	20 (0 – 50)
Neurapraxia	22 (0 – 51)	3 (1.2 – 6.7)
Nerve injury	8.6 (0 – 51)	2.3 (0.8 – 5.3)
Arterial injury	5.5 (1 – 16)	Not reported
Infection	4.5 (0 – 25)	0 (0 – 2)
Haematoma	1.5 (0 – 25)	0.4 (0.4 – 0.5)
Skin complications	2.6 (0 – 26)	9 (3.7 – 48)
Pain	20 (2.4 – 85)	2.9 (2.9 – 5.2)

Average recurrence rates for fasciectomy and fasciotomy at a median time of four years have been estimated to be 39% and 62%, respectively, with 25% of patients having an extension of the disease after five years.[11] Elsewhere in a systematic review of the literature, recurrence rates following surgery were estimated to range from 0% to 71% in studies with follow-up periods of between three weeks and 13 years; however, the authors highlighted that there was significant variation in how recurrence rates were measured and reported.[12]

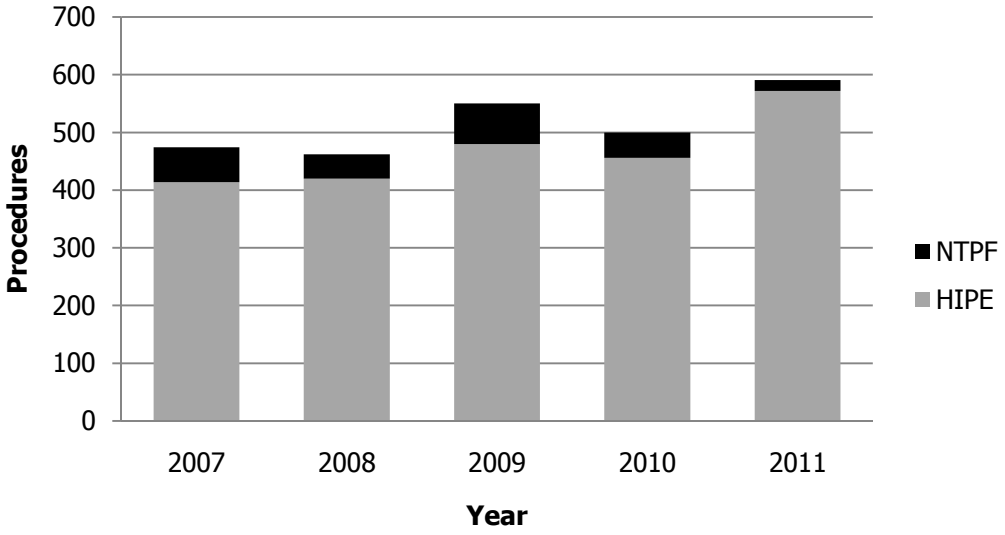
Non-operative treatment

Observation has been recommended as the primary treatment for non-progressive, painless disease with minimal contracture that does not compromise function.[13] Non-operative treatments that are unsupported by good quality evidence include vitamin E cream, radiation, dimethylsulfoxide and splinting.[13;14] There have been limited reports of improvement following local corticosteroid injection.[15] More recently there has been a growing body of research examining enzymatic fasciotomy using clostridium histolyticum collegenase injection, which was approved for use in Ireland in February 2011 under the brand name Xiapex®. Collagenase has been shown to be more effective than placebo,[16;17] but there is a lack of randomised controlled trial (RCT) data directly comparing collagenase to surgery. The main complications associated with this treatment are local injection site reactions such as swelling, bruising, bleeding and pain. Although very common, these reactions were mostly mild to moderate in severity and generally subsided within one to two weeks.[18]

1.4 Current practice in Ireland

HIPE data indicate that between 2007 and 2011 there was a 34% increase in the number of procedures performed annually for Dupuytren's contracture in Irish hospitals (Figure 1.1). The average remained relatively stable at approximately 435 between 2007 and 2010, while 2011 saw a 30% increase in the number of surgeries undertaken. The majority (88%) of procedures in 2011 were coded as fasciectomy operations; 49% of procedures were undertaken by plastic surgeons, 48% by orthopaedic surgeons.[19] Surgery for Dupuytren's contracture is widely available, being undertaken in 29 different hospitals.

Figure 1.1. Number of Dupuytren's procedures performed annually in Ireland between 2007 and 2011[19]*



*HIPE data include all activity in publicly-funded hospitals, including procedures in patients that used private health insurance

A breakdown of activity data is also shown by the proposed hospital group structure that was announced in May 2013 by the Department of Health (Table 1.2 on the following page).[20] The average age of patients undergoing surgery in Ireland in 2011 was 63 years. Nationally, 58% of surgeries were undertaken as day case procedures in 2011, varying from 44% to 86% by hospital group. Day case rates appear to be rising, with incomplete data from 2012 indicating that the overall day case rate for that year was 72%.[19] Release of Dupuytren's contracture is listed as one of the Health Service Executive's (HSE) 'Basket of 24 procedures' – a list of elective surgical procedures for which there is a target that at least 75% of procedures are undertaken as day case surgery. The average length of stay for an inpatient case in 2011 was 1.4 days, with little variability between hospital groups. The HSE's National Clinical Programme for Surgery has specified a target average length of stay of one day for those undergoing palmar fasciectomy involving one digit (ray) – ICD-10 code 46372-00 – which represented 35% of coded procedures in 2011.

Table 1.2 Activity per proposed hospital group* (2011)[19]

Proposed hospital group	Total	% of total	Rate per 10,000 pop.	Average length of stay	Inpatient bed days	% day case	Average age
Dublin East	127	22.5	1.27	1.2	73	57	64
Dublin Midlands	75	13.3	0.94	1.7	51	60	63
Dublin North East	34	6	0.43	1.4	23	65	58
Midwest	44	7.8	1.1	1.3	8	86	61
South/South West	185	32.7	2.18	1.4	141	44	65
West/North West	101	17.8	1.44	1.0	38	67	63
Total	**566**	**100**	**1.23**	**1.3**	**334**	**63**	**62**

* Data for hospitals included in the proposed hospital groups.[20] Please note that this may not reflect all activity in 2011 because not all hospitals that participate in HIPE are included within these proposed hospital groups. HIPE data include all activity in publicly-funded hospitals, including procedures in patients that used private health insurance

Data from May 2013 on waiting times for surgery for Dupuytren's contracture show a total of 156 people were on the waiting list for surgery at that time, with 65% waiting less than six months for surgery and 5% (eight patients) waiting longer than 12 months.[21] Data on the average waiting time for a public outpatient consultant appointment for Dupuytren's disease, which is required before being placed on the surgical waiting list, are not specifically reported. However, at the end of August 2013, it was reported that there were 374,104 patients on the NTPF Outpatient Waiting List database, 58% of whom were waiting less than six months with 78% waiting less than 12 months. [22] Within orthopaedics, it was reported that as of August 2013 there were 52,455 patients on the waiting list, 45% of whom were waiting less than six months and 67% waiting less than 12 months.[22]

Initiatives are underway by the HSE to standardise the management of outpatient services and to ensure that there are consistent management processes across all publicly-funded healthcare facilities that provide outpatient services. This includes the publication of a protocol[23] for the management of these services by the NTPF in January 2013 which provides the core guidance for the Outpatient Services Performance Improvement Programme. This specifies that patients should be treated based on clinical urgency, with urgent referrals seen and treated first. It is intended that the definition of clinical urgency and associated maximum wait times is to be developed at specialty or condition level and agreed by the National Clinical Programmes. In January 2013, the NTPF also published a national waiting list management policy[24] that outlines the standardised approach to managing scheduled care treatment for inpatient, day case and planned procedures in all

publicly-funded hospitals. It outlines a consistent structured approach that must be adopted to the management of the waiting list; monitoring of the implementation of the policy will be routinely undertaken by the NTPF in the form of annual quality assurance reviews.

2 Clinical referral / treatment threshold

2.1 Review of the literature

A comprehensive review of the literature was conducted during May 2013 to identify international clinical guidelines, health policy documents describing treatment thresholds that are in place in other healthcare systems, as well as systematic reviews and economic evaluations examining the effect of the introduction of those thresholds. The approach and general search terms are described in Appendix 1 in the 'Background and Methods' document;[(1)] a summary of the results is included in Table 2.1. A summary of the clinical guidelines and economic analyses identified from the search and thresholds in use elsewhere are provided in Appendices 1 and 2 respectively.

Table 2.1. Summary of literature search results

Publication Type	Number	References
Clinical guidelines	2	(10;25)
Systematic reviews	0	
Cost-effectiveness studies	3	(26-28)

2.2 Clinical evidence

Two sets of clinical guidelines were identified that provided recommended thresholds for non-operative versus operative treatment of Dupuytren's disease.

Guidelines produced by the British Society for Surgery of the Hand (BSSH)[(10)] distinguish between mild, moderate and severe symptoms on the basis of degree of contracture and impact on functional ability. Simple reassurance and observation is recommended in cases where mild symptoms (such as palmar nodules and pits) are present, in the absence of contracture or where there is mild metacarpophalangeal (MCP) contracture less than 30° that does not affect function. Conservative treatment, which includes collagenase injection and percutaneous needle fasciotomy, is recommended where spontaneous resolution does not occur and where the symptoms of the disease are producing notable functional problems. The degree of contracture associated with moderate disease severity in this guideline includes MCP contractures between 30° and 60°, proximal interphalangeal (PIP) contractures less

than 30°, and the presence of first web contracture. Surgery is indicated for severe disease, characterised by severe contracture (MCP greater than 60°, PIP greater than 30°), recurrence or extension of the disease, or diathesis.

In the UK, the National Institute for Health and Care Excellence (NICE) has published a Clinical Knowledge Summary for management of Dupuytren's disease[25] which recommends that evaluation includes a discussion about the impact on hand function and checking for contracture by asking the person to lay their palm and fingers completely flat on a table top (Hueston's tabletop test). No treatment is recommended for those without contracture or functional impairment, apart from reassurance that tender nodules will improve over time and advising the person that they should return if they cannot flatten their outstretched hand on a table top or if hand function deteriorates. Patients with contracture or functional impairment should be referred to secondary care to evaluate their treatment options, which include percutaneous needle fasciotomy and collagenase injection, as well as operative treatment.

No clinical reviews of the effect of threshold introduction or the use of different referral criteria were found. However, a number of thresholds in place in other health systems were identified. These include thresholds from different NHS primary care trusts (PCTs) in England (see Appendix 2) and coverage criteria developed by private health insurance companies in the United States (US).[29] As part of the changes to the NHS brought about by the Health and Social Care Act 2012, PCTs and Strategic Health Authorities (SHAs) ceased to exist on 31 March 2013. Their responsibilities were taken over by Clinical Commissioning Groups and the NHS Trust Development Authority. However, the thresholds that were previously developed by these trusts are likely to represent ongoing practice at a local level while new commissioning guides are being established. These thresholds are broadly in line with the recommendations included in the two guidelines described earlier, with most specifying rapid progression, functional impairment or contracture as indications for referral to specialist services. The degree of contracture threshold varies between different PCTs; some require greater than 30° fixed flexion deformity in the MCP or PIP joint, while others refer patients with greater than 25° contracture in a single joint or greater than 10° contracture in two or more joints. These criteria are sometimes used in combination with criteria stipulating that onward referral should also be made in patients whose finger tips cannot comfortably be pushed to within 2.5cm of the table when the back of the hand is placed on the examination table. Thresholds developed in the US include similar criteria to those in the UK, with surgical treatment being deemed medically necessary in cases with a palpable cord and functional impairment combined with MCP or PIP contracture greater than 20°, rapid progression or symptomatic fibromatosis of the hand.

2.3 Cost-effectiveness evidence

There is a lack of evidence examining the cost-effectiveness of introducing referral and treatment criteria for Dupuytren's disease. An economic analysis using clinic-based, as opposed to theatre-based, treatment for Dupuytren's contracture in the UK found that outpatient interventions (in this case percutaneous needle fasciotomy) cost significantly less than inpatient treatment (limited fasciectomy).[26] This study published in 2009, which excluded medical personnel costs on the basis that these were incurred by the service provider regardless of the type of treatment, estimated inpatient and outpatient costs to be GBP £624 and GBP £15, respectively.[26] A subsequent analysis published in 2011 examining the overall one-year costs of surgery for Dupuytren's contracture in the UK found little difference in the mean per-patient cost for palmar fasciectomy and dermofasciectomy performed on an inpatient or day case basis (0% to 1.8% difference); however, inpatient digital fasciectomies cost approximately GBP £2,000 (63%) more.[27] A 2011 study comparing the cost-effectiveness of non-operative treatment (percutaneous needle fasciotomy and collagenase injection) to traditional fasciectomy found that both of these were more cost-effective when the success rate of percutaneous needle fasciotomy was high and when collagenase injections cost less than USD $1,000.[28]

2.4 Budget impact and resource implications

Diagnostic-related group (DRG) costs for Dupuytren's surgery are not routinely calculated by Casemix, so information on the cost of these procedures in Ireland is unavailable. The overall DRG cost for all hand procedures (AR-DRG code I30) is €3,179 for inpatients and €1,529 for day cases.[30] However, Dupuytren's surgery made up just 13% of the overall number of procedures in this category in 2011, so these costs may not be representative.

Since the criteria used for referral and treatment in the available literature are consistent with the recommendations contained in clinical guidelines, it is not anticipated that introduction of thresholds will significantly reduce the number of procedures performed, but rather they could potentially improve referral pathways and waiting times for outpatient consultant appointments. Continuing trends towards managing patients as day cases rather than inpatients, combined with the emergence of collagenase clostridium histolyticum injection (Xiapex®) as a treatment option, are likely to have a greater impact on the provision of treatment for Dupuytren's disease over the coming years. It has been reported that collagenase treatment costs approximately €800 per vial.[31]

3 Advice on clinical referral / treatment threshold

Apart from reassurance and observation of patients with mild symptoms, there are limited treatment options for Dupuytren's disease available within primary care. Therefore once the condition begins to deteriorate or extend to other areas referral to secondary care services is required to evaluate whether surgery, percutaneous release or collagenase injection are indicated.

Onward referral for a consultant outpatient appointment for Dupuytren's disease should be considered for the following patients:

- those whose loss of finger extension results in significant functional disability and interferes with activities of daily living.
- those with loss of extension of greater than 25° in one joint, greater than 10° in two or more joints, or with evidence of proximal interphalangeal joint contracture.
- those who cannot lay their palm flat on a table (positive Hueston's tabletop test).
- those with rapid progression of contracture.

Patients who are not referred for surgery should remain under the care of their primary care practitioner, who will manage conservative treatment of the patient, including reassessment at appropriate intervals.

4 Discussion

Clinical guidelines[10] advise that referral and treatment of Dupuytren's contracture should depend on the rate of disease progression and the extent to which contractures are affecting a patient's quality of life. Although palmar nodules or pits do not generally warrant surgery, they may be tender and produce some functional impairment.[15] It is estimated that approximately 50% of patients with isolated nodules will ultimately develop a cord, with 9% going on to require surgery.[32]

Unlike some other common hand disorders, Dupuytren's disease is not amenable to treatments that often form part of first-line conservative management of hand disorders in primary care, including physiotherapy and splinting.[13] Once the condition has progressed to being a cause of functional impairment due to fixed flexion deformity, referral for a consultant outpatient appointment is required to consider a range of surgical and non-surgical treatment options. Of note, initiatives

are underway by the Orthopaedic and Rheumatology Clinical Programmes in the HSE to develop interface clinics and consultations between primary and secondary care services in Ireland and to implement agreed national referral guidelines for all patients with musculoskeletal disease.

Perhaps the most significant development in this area over the last number of years has been the approval by the European Medicines Agency of collagenase clostridium histolyticum (Xiapex®) injection for the treatment of Dupuytren's contracture. While more studies examining the long-term effectiveness of this treatment compared to surgical and percutaneous release are needed, the available evidence[33] suggest that it may play an increasing role in the treatment of this disease in the coming years. This may reduce the number of surgical procedures required in this area, but not necessarily the cost of care or the demand for consultant outpatient appointments as administration of Xiapex® is limited to trained hand specialists.

The implementation of stated referral and treatment thresholds for Duptyren's contracture is unlikely to reduce the number of surgical procedures undertaken in Ireland. Between 2007 and 2011, there was a 34% increase in the number of publicly-funded surgical procedures for Dupytren's contracture. As incidence increases with age, it is likely that demand for surgery and subsequent postoperative care will continue to increase due to demographic changes. However, the use of stated thresholds that are integrated into agreed national referral guidelines should bring greater transparency and facilitate timely, equitable access to outpatient consultant appointments. As outlined in the ethical analysis report,[34] if clinical referral or treatment thresholds are implemented, it is imperative that there are opportunities for appeal mechanisms to ensure good governance. Continued trends towards providing this procedure as a day case has the potential to reduce the cost of surgical management without reducing quality of care.

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Appendix 1 – Clinical guidelines and cost-effectiveness studies

Reference	Study Type	Approach and findings

BSSH 2013[10]
 	
UK
	Clinical guideline	Expert consensus review and evidence synthesis, no further details available on where searches were conducted, etc.
		British Society for Surgery of the Hand Recommendations for Treatment
		- Mild
		  o reassure
		  o observe
		- Moderate
		  o needle fasciotomy if appropriately trained; for MCPJ contracture
		  o possibly collagenase
		  o refer for surgery – limited fasciectomy
		- Severe
		  o refer for surgery
		  o limited fasciectomy
		  o dermofasciectomy.

NICE 2010[25] **UK**	**Clinical guideline**	Authors report that 'Good quality evidence from randomised controlled trials is lacking regarding the management of Dupuytren's disease in primary care. The recommendations are therefore based on expert opinion.' For people without contracture (who are able to place their hand flat on a table top) and without significant loss of hand function: No treatment is necessary at this stage. Reassure that tender nodules will become less tender over time. Advise the person to return when they cannot flatten their outstretched hand on a table top or when hand function is compromised. Splinting or stretching to prevent progression of the disease is not recommended. Corticosteroid injections are not recommended. For people with contracture (who are unable to place their hand flat on a table top) or whose hand function is significantly compromised: Refer the person to the local hand surgery service, or a specialist in plastic surgery or orthopaedic surgery.
Webb 2009[26] **UK**	**Cost effectiveness analysis**	Study comparing the cost of treatment of Dupuytren's disease in the outpatient department with the operating theatre. All patients seen in a new patient hand clinic with a diagnosis of Dupuytren's disease, trigger digit or ganglion of the wrist or hand requiring treatment were prospectively identified over a six-month period. The numbers undergoing a procedure in the outpatient clinic or theatre were recorded. Costings of theatre time and outpatient time, as well as national tariff income, were

<table>
<tr><th>Reference</th><th>Study Type</th><th>Approach and findings</th></tr>
<tr><td></td><td></td><td>obtained from the hospital management. Study included 80 Dupuytren's patients followed up over six months; 37 outpatients, 43 surgical patients. Costs shown below.

<table>
<tr><td>Dupuytren's disease</td><td>£</td></tr>
<tr><td>National tariff income (£)</td><td>1,714</td></tr>
<tr><td>Cost in theatre (£)</td><td>624</td></tr>
<tr><td>Cost in outpatients (£)</td><td>15</td></tr>
<tr><td>Net income if performed in theatre (£)</td><td>1,090</td></tr>
<tr><td>Net income if performed in outpatients (£)</td><td>1,699</td></tr>
</table></td></tr>
<tr><td>Gerber 2011[27]

UK</td><td>Cost-effectiveness analysis</td><td>Hospital Episode Statistics were extracted from April 2003 to March 2008 for patients with Palmar Fascial Fibromatosis (ICD10 = M720) and DC-related procedures. Variables included demographics, OPCS, patient status and physician specialty. To estimate 2010-2011 costs, HRG4 codes and the National Schedule of Tariff 2010-11-NHS Trusts were applied to the 2007-2008 period.

Between 2003 and 2008, fasciectomy was the most common surgical procedure for Dupuytren's contracture in England. While procedure rates and physician specialties varied little, there was a reversal in surgical venue: inpatient operations decreased as day case procedures increased. The change is likely due to economic trends and changes to the healthcare system. The individual costs per type of procedure (inpatient and day case) is shown on the following page.</td></tr>
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<tr><th>Reference</th><th>Study Type</th><th>Approach and findings</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td colspan="3">Mean total costs(£)</td><td colspan="3">Mean per-patient costs (£)</td></tr>
<tr><td>Description</td><td>Procedures; n (%)</td><td>Day Case</td><td>Inpatient</td><td>All</td><td>Day Case</td><td>Inpatient</td><td>All</td></tr>
<tr><td>Amputation</td><td>155 (1.1)</td><td>135,072</td><td>86,923</td><td>221,995</td><td>1,468</td><td>1,449</td><td>1,460</td></tr>
<tr><td>Dermofasciectomy</td><td>345 (2.6)</td><td>1,234,094</td><td>1,933,466</td><td>3,167,560</td><td>9,210</td><td>9,207</td><td>9,208</td></tr>
<tr><td>Digital Fasciectomy</td><td>2,126 (16.0)</td><td>4,114,851</td><td>4,211,415</td><td>8,326,266</td><td>3,148</td><td>5,142</td><td>3,916</td></tr>
<tr><td>Division of Palmar Fascia</td><td>510 (3.8)</td><td>434,070</td><td>196,916</td><td>630,986</td><td>1,233</td><td>1,279</td><td>1,247</td></tr>
<tr><td>Other specified excision of other fascia</td><td>76 (0.5)</td><td>36,866</td><td>53,570</td><td>90,436</td><td>1,229</td><td>1,246</td><td>1,239</td></tr>
<tr><td>Palmar Fasciectomy</td><td>9,240 (69.5)</td><td>16,086,039</td><td>9,320,300</td><td>25,406,338</td><td>2,736</td><td>2,785</td><td>2,750</td></tr>
<tr><td>Revision of Digital Fasciectomy</td><td>172 (1.3)</td><td>828,866</td><td>736,608</td><td>1,565,474</td><td>9,210</td><td>9,208</td><td>9,209</td></tr>
<tr><td>Revision of Palmar Fasciectomy</td><td>591 (4.4)</td><td>899,716</td><td>1,152,382</td><td>2,052,098</td><td>2,794</td><td>4,332</td><td>3,490</td></tr>
<tr><td>Unspecified excision of other fascia</td><td>98 (0.7)</td><td>64,668</td><td>50,320</td><td>114,988</td><td>1,198</td><td>1,198</td><td>1,198</td></tr>
<tr><td>Overall total costs in England</td><td></td><td>23,834,242</td><td>17,741,900</td><td>41,576,141</td><td>2,885</td><td>3,534</td><td>3,127</td></tr>
</table>
</td></tr>
<tr><td>Chen 2011[28]

USA</td><td>Cost effectiveness analysis</td><td>US-based study where the authors constructed an expected-value decision analysis model, with questionnaires used to determine utilities. The threshold for a cost-effective treatment is based on the traditional willingness-to-pay of $50,000 per quality-adjusted life year (QALY) gained. A cost-utility analysis was conducted to compare traditional fasciectomy for</td></tr>
</table>

Reference	Study Type	Approach and findings
		Dupuytren's contracture with two new treatments, needle aponeurotomy and collagenase injection. Based on this analysis, open partial fasciectomy is not cost-effective. Needle aponeurotomy is cost-effective if the success rate is high. Collagenase injection is cost effective when priced under US $945.

Appendix 2 – Examples of NHS Primary Care Trust Thresholds

Primary Care Trust (PCT)	Criteria
Bath and North East Somerset	Consider where: ▪ 30 degree fixed flexion deformity at metacarpophalanageal joint or proximal interphalangeal joint: and ▪ cannot flatten fingers or palm on table or ▪ rapid progression over two months.
Bedfordshire and Hertfordshire	Surgical treatment will only be considered if: ▪ The loss of extension results in significant functional disability interfering with activities of daily living for the patient. And one of the following: ▪ patient has loss of extension in one or more joints exceeding 25 degrees or ▪ patient has at least 10 degree loss of extension in two or more joints or ▪ finger tips cannot comfortably be pushed to within 2.5cm of the table when the back of the hand is placed on the examination table. It should be noted that fixed flexion of the metacarpophalangeal joints is usually correctable whatever the degree of fixed flexion, but fixed flexion of the interphalangeal joints is often difficult to correct.
Birmingham East and North	▪ Patient has loss of extension in one or more joints exceeding 25 degrees. ▪ Patient under 45 with >10 degree loss extension in two or more joints. ▪ Evidence of proximal interphalangeal joint contracture.
Black Country Cluster	Mild (no functional problems, no contracture, mild metacarpophalangeal joint contracture only [<30 degrees]) ▪ Intervention: Reassure. Observe Moderate (Notable functional problems or moderate metacarpophalangeal joint contracture [30 - 60 degrees], Moderate proximal interphalangeal joint contracture [<30 degrees]) ▪ Intervention: Needle fasciotomy if appropriately trained for MCPJ contracture; Possibly collagenase; Refer for surgery – limited fasciectomy Severe (Severe contracture of both metacarpophalangeal [>60 degrees] joint and proximal interphalangeal joint [>30 degrees]) ▪ Intervention: Refer for surgery: limited fasciectomy/dermofasciectomy

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For further information please contact:

Health Information and Quality Authority
Dublin Regional Office
George's Court
George's Lane
Smithfield
Dublin 7

Phone: +353 (0) 1 814 7400
URL: www.hiqa.ie