



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Health Technology Assessment of Scheduled Procedures

Ganglion Cyst Surgery

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

About the Health Information and Quality Authority.....	3
1 Ganglion cyst surgery	6
1.1 Scope of this health technology assessment.....	6
1.2 Surgical indications.....	6
1.3 Surgical procedures, potential complications and alternative treatments ...	7
1.4 Current practice in Ireland	7
2 Clinical referral / treatment threshold	10
2.1 Review of the literature	10
2.2 Clinical evidence	10
2.3 Cost-effectiveness evidence	12
2.4 Budget impact and resource implications	12
3 Advice on clinical referral / treatment threshold.....	13
4 Discussion	13
5 References	15
Appendix 1 – Clinical guidelines, systematic reviews and cost-effectiveness studies.....	18
Appendix 2 – Examples of UK NHS PCT thresholds	21

1 Ganglion cyst surgery

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 surgical treatment of ganglion cysts within the publicly-funded healthcare system in Ireland. The effectiveness of this procedure 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 ganglion cysts. Input from an Expert Advisory Group as well as a review of international guidelines, international policy documents and thresholds, and economic evaluations were used to inform the referral criteria. Additionally the resource and budget impact were assessed where appropriate.

1.2 Surgical indications

Ganglion cysts are benign, fluid filled growths that usually form near a joint capsule, tendon or tendon sheath and account for approximately 60% of all benign hand tumours.⁽²⁾ Cysts can develop suddenly or over a period of time; some may resolve spontaneously. They can occur beside any joint in the body, but are most commonly associated with the wrist, hand and fingers. The aetiology of the condition is unknown, with synovial herniation, mucoid degeneration and trauma suggested as possible causes in the literature.⁽³⁾ Women are three times more likely to be affected than men.⁽⁴⁾ and although most cysts develop between the ages of 20 and 40, they can appear at any age and paediatric cases are not rare.⁽⁵⁾ The average cyst is approximately 2cm in diameter, but can be considerably larger.

Patients with ganglion cysts may seek medical consultation because of cosmetic concerns and anxiety about possible malignancy. However, it is estimated that approximately 95% of hand tumours are benign.^(6;7) Ganglion cysts are benign, but may cause pain, especially if located near a nerve; they may also limit range of movement. Many patients can be managed conservatively with reassurance and observation. It has been reported that up to 50% of ganglion cysts resolve spontaneously over time.⁽⁸⁾ Where treatment is required, the two main options are aspiration or surgical excision.

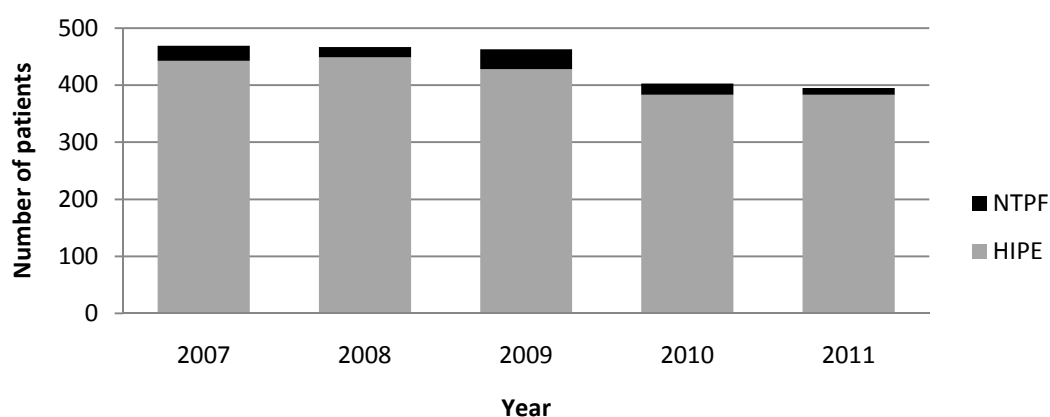
1.3 Surgical procedures, potential complications and alternative treatments

Surgical excision of ganglion cysts can be performed under local or general anaesthetic, depending on where the cyst is located. Both open and arthroscopic surgical techniques can be used. Surgical excision is the definitive treatment for ganglion cysts, but is also associated with the highest risk, since it can result in nerve or blood vessel damage, scarring and tenderness. However, serious complications of surgery are rare.⁽⁹⁾ The most frequent complication is recurrence, which has been estimated to occur in up to 40% of cases.⁽¹⁰⁾

Conservative treatment options include observation and reassurance, splinting for wrist ganglia and aspiration of the cyst. Observation and reassurance that the cyst is benign and that there is high possibility of spontaneous resolution is an option for those with ganglia that are not impacting negatively on quality of life or functional ability. For those with limited range of motion or pain, immobilisation with a splint has been suggested to help reduce the size of the cyst and reduce symptoms.⁽¹¹⁾ Aspiration under local anaesthetic, with or without corticosteroid injection, is the primary non-surgical treatment option for symptomatic cysts. Aspiration carries a risk of nerve damage depending on where the cyst is located,⁽³⁾ and is associated with a higher recurrence rate than surgery.⁽⁴⁾

1.4 Current practice in Ireland

In addition to activity levels in public hospitals, treatment for ganglion cysts has also been procured in private hospitals for the public healthcare system via the National Treatment Purchase Fund (NTPF). Since 2007 there has been a modest decline in the number of hospital-based surgical excisions of ganglion cysts performed annually, from 449 in 2008 to 383 in 2011. (Figure 1.1 on the following page). The average age of patients was 42 years and over two-thirds were female.

Figure 1.1. Ganglion cyst surgical procedures* 2007-2011⁽¹²⁾

Source: HIPE (Hospital In-Patient Inquiry) Scheme and NTPF (National Treatment Purchase Fund).

*HIPE ICD-10AM/ACHI procedure codes 4649400, 3010700, 4649501, 4649800, 4650000, 4650100, 4650200, 4650300. HIPE data include all activity in publicly-funded hospitals, including procedures in patients that used private health insurance

Table 1.1 provides a list of the most common sites of ganglion excision in 2011.

Table 1.1. HIPE procedure codes and percentage of procedures by ganglion site 2011^{(12)*}

HIPE code	Procedure name	Total	(%)
4649400	Excision of ganglion of hand	154	(40)
3010700	Excision of ganglion; not elsewhere classified	104	(27)
4649501	Excision of ganglion of distal digit of hand	42	(11)
4650000	Excision of ganglion of dorsal wrist	35	(9)
4650100	Excision of ganglion of volar wrist	22	(6)
4649800	Excision of ganglion of flexor tendon sheath of hand	14	(4)
	Others	12	(3)

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

Table 1.2 on the following page provides a breakdown of activity per the proposed new acute hospital group structure.⁽¹³⁾ Nationally, 94% of surgeries were undertaken as day case procedures in 2011. The National Clinical Programme for Surgery has an established target that 95% of excisions of hand ganglia are undertaken as day case procedures. HIPE data indicate that 49% of ganglion excisions were undertaken by orthopaedic surgeons, 25% by general surgeons and 24% by plastic surgeons in 2011.

Table 1.2 Activity* per proposed hospital groups in 2011⁽¹²⁾**

Proposed hospital group	Total (%)	Rate per 10,000 population	Average length of stay(days)	Inpatient bed days	% day case	Average age
Dublin East	73 (19%)	0.73	1	16	92	43
Dublin Midlands	52 (14%)	0.65	1	7	92	46
Dublin North East	38 (10%)	0.48	0	0	100	42
Midwest	28 (7%)	0.70	0	2	93	41
South/South West	106 (28%)	1.25	1	7	96	48
West/North West	73 (19%)	1.04	1	9	92	40
Other: paediatric hospitals	10 (3%)	N/A	0	0	100	9

* HIPE ICD-10AM/ACHI procedure codes: 4649400, 3010700, 4649501, 4649800, 4650000, 4650100, 4650200, 4650300.

** Data for hospitals included in the proposed hospital groups.⁽¹³⁾ Please note that this does 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

As of May 2013 there were 64 patients waiting for surgery for ganglion cysts, 72% of whom had been waiting less than six months.⁽¹⁴⁾ Patients are generally referred for an outpatient consultant appointment by their general practitioner (GP). 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.⁽¹⁵⁾ 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.⁽¹⁵⁾

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⁽¹⁶⁾ 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 clinical programmes. In

January 2013, the NTPF also published a national waiting list management policy⁽¹⁷⁾ 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.

It is estimated that a third of GPs routinely aspirate ganglions cysts in Ireland, with the sample then sent for histological analysis to exclude malignancy.⁽¹⁸⁾ Aspiration of ganglion cysts is also provided in the hospital setting and can routinely be performed in outpatient clinics. However, feedback indicates that due to high clinic numbers and the influence of current reimbursement policies, in some hospitals, patients must be rebooked as day cases following outpatient surgical review. This necessitates a repeat hospital visit with associated increased costs and delays for patient and provider.

2 Clinical referral / treatment threshold

2.1 Review of the literature

A review of the literature was conducted up to June 2013 to identify international clinical guidelines, health policy documents describing treatment thresholds that are in place in other health 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 separate 'Background and Methods' document.⁽¹⁾ A summary of the clinical guidelines, systematic reviews and economic analyses retrieved by the search and thresholds in use in other countries are provided in Appendices 1 and 2, respectively.

Table 2.1 Included evidence sources

Publication Type	Number	References
Clinical guidelines	2	(19;20)
Systematic reviews	1	(4)
Cost-effectiveness studies	2	(21;22)

2.2 Clinical evidence

Practice guidelines⁽¹⁹⁾ published in 2011 by the American College of Occupational and Environmental Medicine (ACOEM) recommend that non-operative management is used as the first-line of treatment for acute asymptomatic ganglia, with the option of aspiration of cystic fluid for immediate relief of ganglion-related pain or to improve cosmesis. It states that surgical intervention should be considered following a trial of

non-operative management. No recommendation is provided in relation to the addition of steroids or hyaluronidase injection or splinting after aspiration. These guidelines recommend against multiple punctures of the cyst wall during aspiration or the use of sclerosing agents for closure of the cystic space.

Guidelines⁽²⁰⁾ developed by the British Society of Surgery for the Hand (BSSH) for the treatment of wrist ganglia recommend reassurance and observation for people with asymptomatic cysts on the basis that 55% of untreated ganglia will resolve spontaneously over a six-year period.⁽¹⁰⁾ For people with moderately severe ganglia, characterised by chronic symptoms, occult cysts, prominent swelling or who are fearful that the cyst may be cancerous, reassurance/observation or aspiration is recommended, with a referral for ultrasound or MRI if concerns about the diagnosis persist. The guidelines note a reluctance to aspirate volar wrist ganglia because of the proximity of the radial artery and a theoretical risk of damage to it, but state that at present there is no evidence for this. There is evidence to show that aspiration alleviates symptoms, but is associated with a recurrence rate of between 59%⁽²³⁾ and 88%.⁽²⁴⁾ Three serial aspirations reduce the rate of recurrence to between 12%⁽²⁵⁾ to 15%.⁽²⁶⁾ There is no clear evidence that corticosteroid injection improves outcomes,⁽²⁷⁾ but there is some evidence to suggest that concomitant injection of a corticosteroid and hyaluronidase may reduce recurrence rates.⁽²⁸⁾ However, recurrence is more likely after aspiration and hyaluronidase injection than after surgical excision.⁽²⁹⁾ The BSSH guidelines recommend surgical excision in severe cases, where ganglions are associated with severe pain, restriction of activities of daily living and concerns in regard to diagnosis.

A systematic review⁽⁴⁾ carried out in 2008 of treatments for wrist ganglia found that surgery was more effective at preventing recurrence than aspiration, at least in the short term. The use of hyaluronidase before aspiration can lower recurrence rates. It also found that patients who underwent surgery were more satisfied with their treatment than those who had aspiration or reassurance, but that surgery was associated with higher complication rates, more severe complications and longer time off work. In one study⁽³⁰⁾ the complication rates for surgery, aspiration and reassurance were 20%, 5% and 0%, respectively. The authors concluded that active treatment should only be considered if the ganglion is symptomatic and that surgical excision should only be used as a last resort for symptomatic cysts because of the complications associated with it and the possibility that it does not confer enough benefit to warrant its higher risk. Noting that patients who undergo active treatment are significantly more satisfied than those who were reassured, they suggested that aspiration of wrist ganglia be considered the preferred treatment due to its lower complication rate and lower cost relative to surgery.

No clinical reviews of the effect of threshold introduction or the use of different referral criteria were found. However, a number of thresholds used by primary care trusts (PCTs) in the UK's National Health Service (NHS) were identified (Appendix 2). Although officially disbanded on 31 March 2013 and their functions transferred to other organisations, including Clinical Commissioning Groups and the NHS Trust Development Authority, these thresholds are indicative of recent regional practice in the UK. The criteria for referral and treatment are generally consistent with the guidelines described above and include pain, functional impairment, neurological deficits, inhibition of nail growth, sudden increase in size and doubts about diagnosis.

2.3 Cost-effectiveness evidence

No studies describing the cost-effectiveness of the introduction of referral and treatment thresholds for ganglion cysts were identified.

An economic analysis⁽²²⁾ of management of flexor tendon sheath ganglia carried out in the US in 2002 examined the most cost-effective option for combining aspiration and surgical excision, given the recurrence rates of each. This retrospective study involved 175 patients, with cost data being taken from the US Medicare system. In this analysis, the average cost of curing one patient using surgery only was \$1,842. For one aspiration followed by surgery if needed, the cost per patient was \$565 and for two aspirations followed by surgery, if needed, it was \$265. Therefore, the authors concluded that the most cost-effective treatment strategy was to perform up to two aspirations before considering surgical excision.

A prospective economic analysis⁽²¹⁾ in the UK published in 2009 compared the cost of providing percutaneous aspiration and injection of sclerosant by trained surgeons in the outpatient setting to providing the same procedure in a standard operating theatre. This study, which excluded surgical personnel costs on the basis that that these are incurred by the service provider regardless of the type of treatment, estimated operating theatre and outpatient costs to be £624 and £15, respectively. No complications were noted during the six-month follow-up. The authors concluded that an outpatient-based treatment service has potential for significant cost savings, but that procedures must continue to be provided by trained specialists to maintain a satisfactory outcome and low complication rate.

2.4 Budget impact and resource implications

Diagnostic-related group (DRG) costs for surgical excision of ganglia 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.⁽³¹⁾ However, ganglion surgery

accounted for only 9% of the total number of hand procedures in this category in 2011, so these costs may not be representative.

It is not anticipated that introduction of thresholds will significantly reduce the number of procedures performed, but could potentially improve referral pathways and waiting times for outpatient consultant appointments by facilitating consistent referral patterns that prioritise those who stand to gain the most from treatment.

3 Advice on clinical referral / treatment threshold

Ganglion cysts are benign fluid filled swellings that often resolve without treatment. However, they can result in pain, limited range of motion and decreased quality of life. Recommended first-line treatment for asymptomatic ganglia is observation and reassurance, with the option of aspiration (which is commonly performed in primary care) or surgical excision if the condition progresses and symptoms become more severe. Therefore, the following criteria are advised:

Onward referral for a consultant outpatient appointment for ganglion cysts should be considered for patients:

- in whom the ganglion has resulted in significant functional impairment
- experiencing considerable pain as a result of the ganglion's size or position
- with cysts that are disturbing nail growth or have a tendency to discharge
- with symptoms associated with neurological impairment such as loss of sensation in parts of the hand, evidence of nerve compression or weakness of the wrist
- where there is doubt about the diagnosis (with or without pain).

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

Since a significant proportion of patients will improve without active treatment, observation and reassurance has been recommended as the first-line treatment for asymptomatic ganglia. Surgery is the most effective form of treatment for curing ganglion cysts, but it is associated with a higher rate of complications than aspiration. Therefore, aspiration may be indicated for those with moderately severe symptoms and excision for those with severe symptoms.

Patients seek treatment for this condition for a variety of reasons, including pain, functional impairment and cosmetic concerns. It has been estimated that

approximately a quarter of patients are worried that the cyst might be a malignant growth.⁽³²⁾ Patient satisfaction was also greatest for those who received active treatment rather than reassurance, despite the fact that patient evaluation scores on perception of symptoms and disability across both groups were comparable.⁽¹⁰⁾ It has been suggested that the increased level of satisfaction associated with surgery and aspiration may be related to the extent of the intervention and the speed of resolution.⁽⁴⁾ This highlights the importance of ensuring that patients are fully informed about their treatment options and the possible role of patient information leaflets to provide reassurance and present the relative potential for benefits and harm, including recurrence rates, arising from each of the treatment options.

Although beyond the specific remit of this assessment, feedback was provided around anomalies in the service location in which aspiration of ganglion cysts is provided. While it was noted that cyst aspiration may be safely provided in the primary care setting or outpatient clinics by trained providers, current reimbursement policies and high outpatient clinic numbers influence local practice. As not all GPs undertake ganglion aspiration, patients may be referred to other GPs for outpatient surgical review. Within some hospitals, patients must be rebooked as day cases following review in the outpatient clinic. This necessitates a repeat hospital visit with associated increased costs and delays for patient and provider. Initiatives described in the Department of Health's 'Money follows the patient policy paper on hospital financing,' where funding will be based on the episode of care and not by reference to the care setting, may reduce inefficiencies due to funding anomalies.⁽³³⁾

Since 2007 there has been a modest decline in the number of hospital-based surgical excisions of ganglion cysts performed annually, with approximately 380 cases per year in 2010 and 2011. The fact that the recommended threshold is consistent with well established clinical guidelines and the findings of literature reviews means its introduction is unlikely to represent a major change from current practice, but rather a standardisation of referral and treatment criteria across all areas of the publicly-funded healthcare system. As outlined in the chapter on ethical issues,⁽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 aspiration of ganglion cysts by trained providers in the primary care or outpatient setting and the provision of surgery as a day case or within a minor procedure setting have the potential to reduce the overall cost of managing ganglion cysts without reducing quality of care.

5 References

- (1) Health Information and Quality Authority. *A series of health technology assessments (HTAs) of clinical referral or treatment thresholds for scheduled procedures. Background chapter*. Dublin: Health Information and Quality Authority; 2013.
- (2) Thornburg LE. Ganglions of the hand and wrist. *J Am Acad Orthop Surg*. 1999; 7(4) pp.231-8.
- (3) Bush DC. Soft tissue tumors of the forearm and hand. Mackin EJ, Callahan AD, Skirven TM, et al, (Eds) In: *Rehabilitation of the hand and upper extremity. 5th Edition*. St. Louis; Mosby; 2002.
- (4) ASERNIP-S. *Clinical treatments for wrist ganglia*. Australia: The Royal Australasian College of Surgeons; Report No.: 63. 2008.
- (5) Cooper C. Chapter 21 – Ganglion Cysts and Other Common Tumors of the Hand and Wrist. Cynthia C, MFA, MA, OTR/L, – Cynthia Cooper MMO, (Eds) In: *Fundamentals of Hand Therapy*. Saint Louis. Mosby; 2007. pp.412-20.
- (6) Thomas BP, Sasi K, Pallapati SC, Mathew A, Sreekanth R, Thomas M. Malignant tumours of the hand and wrist. *Indian J Plast Surg*. 2011; 44(2) pp.337-47.
- (7) Lin SJ, Dumanian G. *Hand, Benign Tumors*. Medscape Reference [serial online]. 2009, [Online]. Available from: <http://emedicine.medscape.com/article/1286448-overview>. Accessed on: 18 July 2013.
- (8) Gude W, Morelli V. Ganglion cysts of the wrist: pathophysiology, clinical picture, and management. *Curr Rev Musculoskelet Med*. 2008; 1(3-4) pp.205-11.
- (9) Kang L, Akelman E, Weiss AP. Arthroscopic Versus Open Dorsal Ganglion Excision: A Prospective, Randomized Comparison of Rates of Recurrence and of Residual Pain. *The Journal of Hand Surgery*. 2008; 33(4) pp.471-5.
- (10) Dias JJ, Dhukaram V, Kumar P. The natural history of untreated dorsal wrist ganglia and patient reported outcome 6 years after intervention. *J Hand Surg Eur Vol*. 2007; 32(5) pp.502-8.
- (11) American Society for Surgery of the Hand (ASSH). *Ganglion Cysts*. 2013, [Online]. Available from: <http://www.assh.org/Public/HandConditions/Pages/GanglionCysts.aspx>. Accessed on: 22 July 2013.
- (12) Hospital In-Patient Enquiry. *Hospital In-Patient Enquiry (HIPE) Portal data*. Ireland: ESRI; 2013.

- (13) Department of Health. *The Establishment of Hospital Groups as a transition to Independent Hospital Trusts*. Dublin, Ireland: 2013.
- (14) National Treatment Purchase Fund (NTPF). *Hospital elective surgery waiting list data (May 2013)*. Ireland: NTPF; 2013.
- (15) National Treatment Purchase Fund (NTPF). *NTPF Out Patient Waiting List – 30/08/2013*. 2013, [Online]. Available from: http://www.ntpf.ie/home/nwld_outp.htm. Accessed on: 22 October 2013.
- (16) National Treatment Purchase Fund. *Protocol for the management of outpatient services*. Ireland: NTPF; 2013.
- (17) National Treatment Purchase Fund. *National waiting list management policy*. Ireland: NTPF; 2013.
- (18) Expert Advisory Group for the HIQA HTA on Scheduled Surgical Procedures. Personal communication. 18 June 2013.
- (19) Hand, wrist and forearm disorders, not including carpal tunnel syndrome. Hegman KT, (Ed) In: *Occupational medicine practice guidelines: Evaluation and management of common health problems and functional recovery in workers. 3rd Edition*. Elk Grove Village (IL). American College of Occupational and Environmental Medicine (ACOEM); 2011.
- (20) *BSSH Evidence for Surgical Treatment (BEST) – Wrist Ganglion Cyst 850*. British Society of Surgery of the Hand, London, England; 2013.
- (21) Webb JA, Stothard J. Cost minimisation using clinic-based treatment for common hand conditions – a prospective economic analysis. *Ann R Coll Surg Engl*. 2009; 91(2) pp.135-9.
- (22) Bittner JG, Kang R, Stern PJ. Management of flexor tendon sheath ganglions: a cost analysis. *J Hand Surg Am*. 2002; 27(4) pp.586-90.
- (23) Nield DV, Evans DM. Aspiration of ganglia. *J Hand Surg Br*. 1986; 11(2) p.264.
- (24) Burke FD, Melikyan EY, Bradley MJ, Dias JJ. Primary care referral protocol for wrist ganglia. *Postgrad Med J*. 2003; 79(932) pp.329-31.
- (25) Zubowicz VN, Ishii CH. Management of ganglion cysts of the hand by simple aspiration. *J Hand Surg Am*. 1987; 12(4) pp.618-20.
- (26) Oni JA. Treatment of ganglia by aspiration alone. *J Hand Surg Br*. 1992; 17(6) p.660.
- (27) Varley GW, Needoff M, Davis TR, Clay NR. Conservative management of wrist ganglia. Aspiration versus steroid infiltration. *J Hand Surg Br*. 1997; 22(5) pp.636-7.

- (28) Paul AS, Sochart DH. Improving the results of ganglion aspiration by the use of hyaluronidase. *J Hand Surg Br.* 1997; 22(2) pp.219-21.
- (29) Jagers Op AM, Van Der HM, Brink PR. Hyaluronidase versus surgical excision of ganglia: a prospective, randomized clinical trial. *J Hand Surg Br.* 2002; 27(3) pp.256-8.
- (30) Dias J, Buch K. Palmar wrist ganglion: Does intervention improve outcome? A prospective study of the natural history and patient-reported treatment outcomes. *The Journal of Hand Surgery: British & European Volume.* 2003; 28(2) pp.172-6.
- (31) National Casemix Programme. *Ready Reckoner of Acute Hospital inpatient and daycase activity and costs (summarised by DRG) relating to 2011 costs and activity.* Ireland: Health Service Executive; 2013.
- (32) Westbrook AP, Stephen AB, Oni J, Davis TR. Ganglia: the patient's perception. *J Hand Surg Br.* 2000; 25(6) pp.566-7.
- (33) Department of Health. *Money Follows the Patient Policy Paper on Hospital Financing. Draft for Consultation.* Dublin: Department of Health; 2013.
- (34) Health Information and Quality Authority. *Health Technology Assessment of Scheduled Procedures: Ethical Analysis.* 2013, [Online]. Available from: <http://www.hiqa.ie/healthcare/health-technology-assessment/assessments/scheduled-procedures>.

Appendix 1 – Clinical guidelines, systematic reviews and cost-effectiveness studies

Reference	Study Type	Approach and findings						
ACOEM 2011⁽¹⁹⁾	Clinical guideline	<p>Evidence-based clinical guidelines produced by the American College of Occupational and Environmental Medicine, based on systematic reviews and meta-analyses.</p> <p>Evidence rated as follows;</p> <p>A – Strong evidence; two or more high-quality studies.</p> <p>B – Moderate evidence; at least one high quality study or multiple moderate quality studies.</p> <p>C – Limited evidence base; at least one study of moderate quality.</p> <p>I – Insufficient evidence; evidence is insufficient or irreconcilable.</p> <table border="1"> <thead> <tr> <th>Recommended</th> <th>No Recommendation</th> <th>Not Recommended</th> </tr> </thead> <tbody> <tr> <td> <p>Education for selected patients (I).</p> <p>Use of non-operative management (no treatment) for acute asymptomatic wrist and hand ganglia as first-line management (I).</p> <p>Aspiration of the cystic fluid as it may result in immediate relief of acute cosmetic and ganglia-related pain (I).</p> <p>Surgical intervention for sub-acute or chronic upper extremity ganglia after a trial of non-operative</p> </td> <td> <p>Addition of steroids with aspiration (I).</p> <p>Splinting after aspiration for acute or sub-acute dorsal or volar wrist ganglia as splinting may have uncertain efficacy and may lead to prolonged joint stiffness (I).</p> <p>Instillation of hyaluronidase into the cystic structure after aspiration (I).</p> </td> <td> <p>Technique of multiple punctures of the cyst wall as it does not provide improved benefit over simple aspiration (I).</p> <p>Use of sclerosing agents, such as phenol and hypertonic saline, which when instilled, are intended to result in scarring and closure of the cystic potential space (I).</p> </td> </tr> </tbody> </table>	Recommended	No Recommendation	Not Recommended	<p>Education for selected patients (I).</p> <p>Use of non-operative management (no treatment) for acute asymptomatic wrist and hand ganglia as first-line management (I).</p> <p>Aspiration of the cystic fluid as it may result in immediate relief of acute cosmetic and ganglia-related pain (I).</p> <p>Surgical intervention for sub-acute or chronic upper extremity ganglia after a trial of non-operative</p>	<p>Addition of steroids with aspiration (I).</p> <p>Splinting after aspiration for acute or sub-acute dorsal or volar wrist ganglia as splinting may have uncertain efficacy and may lead to prolonged joint stiffness (I).</p> <p>Instillation of hyaluronidase into the cystic structure after aspiration (I).</p>	<p>Technique of multiple punctures of the cyst wall as it does not provide improved benefit over simple aspiration (I).</p> <p>Use of sclerosing agents, such as phenol and hypertonic saline, which when instilled, are intended to result in scarring and closure of the cystic potential space (I).</p>
Recommended	No Recommendation	Not Recommended						
<p>Education for selected patients (I).</p> <p>Use of non-operative management (no treatment) for acute asymptomatic wrist and hand ganglia as first-line management (I).</p> <p>Aspiration of the cystic fluid as it may result in immediate relief of acute cosmetic and ganglia-related pain (I).</p> <p>Surgical intervention for sub-acute or chronic upper extremity ganglia after a trial of non-operative</p>	<p>Addition of steroids with aspiration (I).</p> <p>Splinting after aspiration for acute or sub-acute dorsal or volar wrist ganglia as splinting may have uncertain efficacy and may lead to prolonged joint stiffness (I).</p> <p>Instillation of hyaluronidase into the cystic structure after aspiration (I).</p>	<p>Technique of multiple punctures of the cyst wall as it does not provide improved benefit over simple aspiration (I).</p> <p>Use of sclerosing agents, such as phenol and hypertonic saline, which when instilled, are intended to result in scarring and closure of the cystic potential space (I).</p>						

		<p>management (C).</p> <p>No general indication for one surgical technique (arthroscopic or open excision) over another for all cases and both are recommended (C).</p>			
BSSH 2013⁽²⁰⁾	Clinical guideline	<p>Expert consensus review and evidence synthesis, no further details available on extent of search or grading of evidence.</p> <p>British Society for Surgery of the Hand recommendations for Treatment</p> <p>Mild Reassure / Observe.</p> <p>Moderate Reassure / Observe. Aspiration for cancer reassurance. Refer for ultrasound / MRI if concerns re diagnosis.</p> <p>Severe Refer for surgery.</p>			
ASERNIP-S 2008⁽⁴⁾	Systematic review	<p>Systematic review of clinical effectiveness that searched for primary evidence (Pubmed, EMBASE) as well as previous high quality reviews (Cochrane, York Centre for Reviews and Dissemination and BMJ Evidence).</p> <p>The findings and conclusions were:</p> <ol style="list-style-type: none"> 1. There is discrepancy with regards to the relative recurrence rates of various treatments in the included studies. There is some evidence that surgical excision may be no better than aspiration or reassurance in preventing recurrence. However, several trials indicated that surgical excision appears to be significantly more effective in preventing ganglia recurrence compared to aspiration, at least in the short term (less than six months). 2. Patients treated with surgical excision were significantly more satisfied compared to those who received aspiration or reassurance, despite the fact that resolution of symptoms was lowest compared to aspiration and reassurance. Patient satisfaction appeared to be related to the extent of intervention and speed of resolution of the mass instead of symptom improvement. 3. Surgical excision is associated with higher complication rates and may cause more severe complications compared to aspiration and reassurance. 4. Surgical excision is associated with longer time off work. 			

		<p>5. Limitations of the current evidence base include lack of studies including reassurance as a comparator, short follow-up durations, small patient numbers, and insufficient measures of effectiveness. The best evidence currently available on the treatment of wrist ganglia are non-randomised comparative studies. The published randomised and pseudorandomised trials lack methodological detail and sufficient outcome measures, and are not suitable to determine the relative effectiveness of clinical treatment against simple reassurance.</p> <p>6. Based on the available evidence, wrist ganglia should be treated only if symptomatic. Surgical excision should be used as a last resort in view of the relatively high complication rates and the possibility that it does not confer enough benefit to warrant the higher risk. Due to the apparent patient value placed on intervention, aspiration may be considered as the preferred clinical treatment due to its lower complication rates and lower cost relative to excision.</p>								
<p>Webb 2009⁽²¹⁾</p>	<p>Costing study</p>	<p>Study comparing the cost of treatment of ganglion cysts in the outpatient department with the operating theatre – included 26 patients followed up over six months; 23 outpatients, three surgical patients. Costs shown below.</p> <table border="1" data-bbox="676 657 1496 903"> <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>437</td> </tr> <tr> <td>Net income if performed in outpatients (£)</td> <td>1046</td> </tr> </table> <p>The authors concluded that outpatient based treatment of selected cases of ganglia results in significant cost savings when compared to formal surgical treatment. They note that these procedures still need to be performed by a hand specialist in order to maintain a satisfactory outcome and low complication rates.</p>	Cost in theatre (£)	624	Cost in outpatients (£)	15	Net income if performed in theatre (£)	437	Net income if performed in outpatients (£)	1046
Cost in theatre (£)	624									
Cost in outpatients (£)	15									
Net income if performed in theatre (£)	437									
Net income if performed in outpatients (£)	1046									
<p>Bittner 2002⁽²²⁾</p>	<p>Cost-effectiveness analysis</p>	<p>Retrospective review of patients' charts from 1998 through 1999 with a diagnosis of flexor tendon sheath ganglion. Data were collected from documented history and physical examinations, operative reports, billing records, and telephone interviews. Patients were included if they were correctly diagnosed as having flexor tendon sheath ganglions, participated in the telephone interview, and had not had surgical excision of the ganglions incidentally. Of the 259 patients coded as having flexor tendon sheath ganglions, 175 met the inclusion criteria. In addition, 2001 Medicare-assigned relative value units and fees were used to calculate the most cost-effective treatment. Of the 141 patients treated with aspiration, 66% exhibited no recurrence after two consecutive treatments. Thirteen of 14 patients (93%) who had ganglions excised without prior aspiration showed no recurrence. All 29 patients who had excision after one (n=24) or two (n=5) failed aspirations were cured. Because few patients require excision after two aspirations, the most cost-effective treatment for recurrent flexor tendon sheath ganglions was found to be two aspirations before excision.</p>								

Appendix 2 – Examples of UK NHS PCT thresholds*

Primary care trust (PCT)	Criteria
Bath and North East Somerset	<p>Cases will only be funded if they meet the criteria below:</p> <p>The ganglion has resulted in significant functional impairment OR The individual is experiencing considerable pain as a result of the ganglion's size or position OR Where there is doubt about the diagnosis (with or without pain). Significant functional impairment is defined as: Symptoms prevent the patient fulfilling vital work or educational responsibilities. Symptoms prevent the patient carrying out vital domestic or carer activities.</p>
Bedfordshire and Hertfordshire	<p>Significant functional impairment (restriction of work/domestic/care duties) OR significant pain OR neurological loss OR weakness of the joint OR inhibition of nail growth.</p>
Black Country Cluster	<p>Unless one or more of the minimum criteria are met, surgical removal of ganglion will not normally be funded:</p> <p>Ganglia at the wrist – symptomatic (painful) or neurovascular compromised OR Ganglia arising in the base of the digitis – (symptomatic and/or painful) OR Mucoid cysts arising in the DIP joint disturbing nail growth or have a tendency to discharge.</p>
Bournemouth and Poole	<p>Requests for treatment will be considered when:</p> <p>Mucoid cysts that are disturbing nail growth or have a tendency to discharge (risk of septic arthritis in distal inter-phalangeal joint) OR Symptoms associated with the ganglion, such as loss of sensation in parts of the hand, neurological evidence of nerve compression loss or weakness of the wrist OR Persistent severe pain with functional impairment which prevents the individual from fulfilling work/study/carers or domestic responsibilities. The level of functional impairment will need to be detailed in the individual treatment request. This should include the range of movement compared to the unaffected joint. OR Where there is doubt about the diagnosis.</p>
Bristol, North Somerset and	<p>Referral for ganglion in secondary care is commissioned on a restricted basis. Cases will only be funded if they meet the criteria below:</p> <ul style="list-style-type: none"> ■ The ganglion has resulted in functional impairment which prevents the

Primary care trust (PCT)	Criteria
South Gloucestershire	<p>individual from fulfilling work/study/carer or domestic responsibilities.</p> <p>OR</p> <ul style="list-style-type: none"> ■ The individual is experiencing considerable pain as a result of the ganglion's size or position. <p>OR</p> <ul style="list-style-type: none"> ■ Where there is doubt about the diagnosis (with or without pain). <p>To enable the PCT to approve individual cases the following information with examples of functional impairment using the guidance below should be provided:</p> <ul style="list-style-type: none"> ■ precise location of ganglion e.g. flexor tendon ■ size in cm/inches (length and width) ■ how function of the area is impaired, i.e. what is the patient unable to do as a result of the ganglion? ■ impact on work/studies/care i.e. is the patient unable to fulfil any work/study/carer essential activities and if so to what extent? ■ impact on daily activities, i.e. is the patient unable to carry out essential domestic activities such as cooking, washing etc.? ■ degree of pain ■ how long it has existed and treatments tried to date.
Buckinghamshire and Milton Keynes	<p>Referral for secondary care will be recommended for any one of the following circumstances:</p> <ol style="list-style-type: none"> 1. Ganglion associated with other medical condition such as Rheumatoid Arthritis. 2. Ganglion has suddenly increased in size. 3. Pain in the hand or wrist with the ganglion. 4. Any neurological loss or weakness of the wrist with the ganglion. <p>Ultrasound before referral should be considered if the diagnosis is uncertain.</p>
Derby City and Derbyshire	<p>The PCT will only fund surgery in the following circumstances:</p> <ol style="list-style-type: none"> A. Ganglion on wrist with evidence of neurovascular compromise or significant pain. B. Seed ganglia at base of digits with significant pain. C. Mucoïd cysts at DIP joint which has disrupted the nail growth or there are cysts that tend to discharge.
North Essex	<p>Referral for surgical removal of ganglion in secondary care is commissioned on a restricted basis. Cases will only be funded if they meet the criteria below:</p> <ul style="list-style-type: none"> ■ painful seed ganglia OR ■ mucoïd cysts that are disturbing nail growth or have a tendency to discharge (risk of septic arthritis in distal inter-phalangeal joint) OR ■ symptoms associated with the ganglion such as pain, increase in size, loss of sensation in parts of the hand, neurological loss or weakness of the wrist OR ■ the ganglion has resulted in functional impairment which prevents the individual from fulfilling work/study/carer or domestic responsibilities OR ■ where there is doubt about the diagnosis.

* As part of the changes to the NHS brought about by the Health and Social Care Act 2012, Primary Care Trusts (PCTs) and Strategic Health Authorities (SHAs) ceased to exist on 31 March 2011. Their responsibilities were taken over by Clinical Commissioning Groups and the NHS Trust Development Authority.

Published by the Health Information and Quality Authority.

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

© Health Information and Quality Authority 2013