Health Technology Assessment (HTA)

Stakeholder Feedback for Vertebroplasty or Kyphoplasty in Acute Osteoporotic Painful Vertebral Compression Fractures

This document includes stakeholder feedback received on the draft HTA report on vertebroplasty and kyphoplasty in acute osteoporotic painful vertebral compression fractures. Stakeholder feedback is presented in black font, and the HTA authors' responses are presented in *blue italics*.

Table of Contents

Curafutura

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

Grundsätzlich kann festgestellt werden, dass sich der vorliegende Assessmentbericht in weiten Bereichen an den üblichen wissenschaftlichen Standards orientiert. Dies betrifft weitgehend die Literatursuche und -bearbeitung. Auffallend ist allerdings, dass die der Assessmentbericht des LBIHTA (Wien) von 2010 sowie der HTA-Bericht des SMB von 2011 zum gleichen Thema in der Literaturliste nicht zu finden sind. In der abschliessenden Diskussion fehlt denn auch ein Vergleich den früheren Analyseergebnissen zur Situation in der Schweiz.

- *Since 2010-2011, four RCTs evaluating kyphoplasty and seven RCTs evaluating vertebroplasty have been published. The LBI HTA contains 1 of the 12 RCTs evaluating PVP included in the current HTA and the SMB HTA contains 5 of the 12 RCTs. Therefore, as the LBI and SMB HTAs do not include a comparable evidence base, they were omitted from the discussion.*

Auffällig ist, dass die Datenlage nicht gut ist. Es fehlt einerseits an Reviews und Metaanalysen. Andererseits sind die RCT-Studien in Bezug auf die eingeschlossenen Patienten sehr heterogen. Obwohl in PICO festgehalten wird, dass der Fokus auf Patientengruppen gelegt werden soll «that does not respond to CT» wird in der Folge nicht darauf eingegangen. Nur ein Viertel der berücksichtigten RCT berücksichtigt dies in den Einschlusskriterien. Im vorliegenden Assessmentbericht setzen sich die Autoren mit dieser Tatsache jedoch nicht mehr auseinander und es wird auch keine Subgruppenauswertung gemacht.

- *It is acknowledged that several RCTs do not explicitly state whether patients failed CT and hence do not align with one aspect of the PICO. However, the RCTs match other aspects of the PICO criteria; they are broadly congruent with Swiss practice, and there are no limitations for the reimbursement of PVP in Switzerland. Therefore, the RCTs should be included in the HTA. Section 7.6.1 Applicability for PVP, has been updated to reflect concerns regarding whether patients failed CT.*

Kommentar zu efficacy, effectiveness und safety

Die Langzeitdaten zeigen auf, dass keine klinisch relevanten Unterschiede (MCIDs) nach >12 Monaten vorliegen. Auch scheint es langfristig keine Unterschiede in der Menge an verabreichten Schmerzmitteln oder Quality of Life zu geben. Einzig die Daten der US Medicare database zeigen einen gewissen Langzeiteffekt der PVP Intervention. Diese Daten sind allerdings eher von schwacher Aussagekraft. Auch ist unklar inwieweit die Behandlungs- und Betreuungsmuster der verschiedenen Studien den schweizerischen Standards entsprechen.

- *The extent to which the included studies correspond to the Swiss context are reported in Section 7.6 Applicability.*

Kommentar zur gesundheitsökonomie

Nicht nachvollziehbar sind die im Bericht verwendeten Fallzahlen (2018: PVP: 2'674; PBK: 1'501; Total= 4'175). Die vom BAG und BFS publizierten Fallzahlen für 2018 liegen deutlich tiefer (Total: 2386 bzw. 2591). Bei der Kostenprojektion wurde u.E. die in den vergangenen Jahren sinkenden relativen Kostengewichte nicht berücksichtigt. Unklar bleibt auch, wie mit den im ambulanten Bereich angefallenen Kosten, insbesondere mit den Kosten für Physiotherapie umgegangen wurde. Physiotherapie ist, wie auch die Autoren im Text festgehalten haben, ein wichtiger Kostentreiber. Unklar ist weiter, ob die in den berücksichtigen Studien gefundenen Behandlungs- und Betreuungsmuster auch dem schweizerischen Setting entsprechen, oder ob nicht weitere Modellanpassungen notwendig sind. Auf jeden Fall sind die ökonomischen Ergebnisse nur mit grossen Einschränkungen für Entscheide nützlich.

- *The data for vertebroplasty and kyphoplasty were sourced using CHOP codes (7A.4, 7A.40, 7A.41, 7A.42, 7A.43, 7A.44, 7A.49, 81.66, 81.66.00, 81.66.99, 81.66.11, 81.66.12, 81.66.13,*

81.66.10, 81.65, 81.65.11, 81.65.00, 81.65.10, 81.65.99, 81.65.12, 81.65.13) and the cost weights were obtained from the following source:
    - *https://datenspiegel80.swissdrg.org/drgs/5ba4b5e23bba1e5e8056aff7?locale=de*
- *There was limited information regarding typical outpatient costs associated with the procedures. It was assumed most of the work-up and follow-on costs are the same for intervention and comparator arms with the cost per physiotherapy visit sourced from the FOPH.*

Die Autoren betonen im Text, dass sie die «health insurance perspective» einnehmen. Allerdings wurde nicht mehr auf die Kostenteilung im Bereich der stationären Versorgung eingegangen. Dies betrachten wir nicht als Mangel, sondern eher als fehlendes Systemwissen.

- *The perspective of the HTA is that of the payer perspective which is reflected in the DRG weight and cost paid to hospitals. The report has been amended to reflect the terminology change.*

Kommentar zu ethischen, sozialen und legalen aspekten

Die Aussagen zu legalen, sozialen und ethischen Aspekten (Kapitel 9, 10 und 11) sind sehr bescheiden und wenig aussagekräftig. Es wurde keine Auslegeordnung gemacht, damit fehlen jedoch wichtige Grundlagen für das Appraisal, welches in der ELGK erfolgen sollte. Die Autoren sind mit dem schweizerischen Gesundheitssystem nur wenig bekannt. Man müsste sich daher überlegen, ob bei der Wahl von ausländischen Expertengruppen nicht eine Kooperation mit einem schweizerischen Experten zwingend vorzuschreiben ist, um vor allem die Bereiche Gesundheitsökonomie, Recht, Soziales, Ethik und Organisatorische Aspekte zu unterstützen.

- *The results for the legal, social and ethical sections were informed by systematic and non-systematic literature searches. There were relatively few studies discussing these aspects of PVP and PBK, hence the discussion was limited. Further, independent experts reviewed each section to identify any outstanding issues.*
- *It is beyond the scope of this HTA to collect primary data or engage with expert groups to identify additional legal, social and ethical issues.*

Kommentar zu organisatorischen aspekten

Nicht weiter untersucht wurde die Frage nach dem Ort der Durchführung der Eingriffe. Auf qualitative Unterschiede zwischen Zentren mit viel Erfahrungen und kleineren Einrichtungen mit wenig Erfahrung. Dies hätte jedoch sicher Auswirkungen auf den Entscheid zu möglichen Einschränkungen oder Präzisierung der Leistungspflicht.

- *The impact of hospital and operator volume/experience could not be determined owing to the absence of published literature evaluating these factors in the context of PVP and PBK.*

Kommentar zu diskussion und schlussfolgerungen

Das HTA zeigt auf, dass der Langzeitnutzen von PVP und PBK nicht klar gezeigt werden kann. Der grösse Nutzen scheint bei akuten Frakturen zu sein welche zeitnah behandelt werden. Allerdings fehlen dazu neben dem Ort der Leistungserbringung auch eine Untersuchung nach Lokalisationshöhe (HWS, BWS, LWS), die für den Outcome vermutlich eine relevante Bedeutung haben und damit mögliche Einschränkungen beeinflussen.

- *The effectiveness of PVP and PBK per spinal region could not be determined because studies did not delineate their analysis based on the fracture's location and there were no RCTs specifically evaluating cervical or sacral vertebral fractures.*

Médecins Fribourg - Ärztinnen und Ärzte Freiburg (MFÄF)

Letter

Madame, Monsieur,

Nous nous référons à la procédure de consultation sous rubrique et vous remercions de nous permettre de donner notre position. Vous trouverez ci-dessous nos remarques et commentaires.

Nous trouvons pour le moins curieux de confier ce rapport à des épidémiologistes australiens, dans un pays qui s'est prononcé contre les vertébroplasties et ceci à la suite de deux études (RCT) les plus controversée de la littérature sur les prise en charge des fractures vertébrales. Ce RCT écrit par le Prof Buchbinder et al. en 2009, ainsi que l'étude de Kallmes et al. en 2009, ont été fortement décriés pour des problèmes méthodologiques graves, en particulier un traitement chirurgical incorrect versus des opérations placebo. Ces deux études sont à l'origine de la prise de position de l'Australie et de l'American Academy of Orthopaedics Surgeon (AAOS) qui se prononcent contre la vertébroplastie, mais il eut été correct de mentionner que l'AAOS se prononce en faveur de la kyphoplastie. Il eut probablement également été correct de citer les prises de positions de sociétés internationales telle que l'ISASS, ou de mentionner d'autres pays que l'United Kingdom ayant fait effectuer des HTA, par exemple l'Irlande en 2013. Et enfin de tenir compte des innombrables éditoriaux de revues des plus variées concernant ces études controversées.

- *The authors declared no conflicts of interest at the start of the report.*
- *Section 11 has been updated to include position statements from Schweizerische Vereinigung gegen die Osteoporose (SVGO).*
- *The research question in the HTA aims to address the policy question, which deals with the use of PVP and PBK in Switzerland. At the time of writing the report, there were no limitations governing the reimbursement of PVP. Patients with older fractures could access the PVP. Therefore, it was deemed appropriate to include trials which also considered older fractures (Buchbinder 2009 and Kallmes 2009).*
- *However, the authors acknowledge that fracture age is (likely) used to inform clinical practice and may influence the effectiveness of PVP. To explore the effects of fracture age, sub-group analysis was performed on fractures <8 weeks and >8 weeks. The <8 weeks sub-group omits studies by Buchbinder 2009 and Kallmes 2009. Lastly, bias concerns with the Buchbinder 2009 and Kallmes 2009 studies were assessed using the Cochrane risk-of-bias tool.*

Dans leurs conclusions de la faisabilité, les auteurs suggèrent que leurs conclusions ne différeront pas de la plus récente revue Cochrane, revue qui est écrite par les auteurs justement décriés des deux études mentionnées plus haut ! Il existe donc un sérieux risque de biais dans cette étude HTA, si l'on ne pondère pas en examinant également les résultats cliniques en enlevant des comparaisons des études qui ne correspondent pas à la pratique actuelle de la majorité des chirurgiens et radiologues de par le monde.

- *As above, the concerns regarding the inclusion of the Buchbinder 2009 and Kallmes 2009 trial were addressed using sub-group analysis and risk of bias appraisal.*

De plus il faudrait pour le moins signaler que les techniques actuelles ne comportent pas que les vertébroplasties et kyphoplasties à ballonnet, mais d'autres techniques chirurgicales, parfois associées à des spondylodèse par système pédiculaires, et dans d'autres lésions que les fractures ostéoporotiques mais également sont utilisées dans des fractures traumatiques et dans certaines tumeurs vertébrales, dans certains cas de métastases ou de myélome multiple.

- *The report mentions other indications for PVP and PBK in Section 3.1, noting that they are outside the scope of the present evaluation.*

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

MFÄF souhaite protester contre le faire de recevoir un tel document avec uniquement un mois pour répondre et de surcroît en plein été. Ceci est vraiment désolant.

En sus du commentaire introduit au point deux, le courrier envoyé le 30 septembre 2019 s'avère toujours d'actualité (en pièce jointe du mail).

- *No amendment(s) required.*

Kommentar zu efficacy, effectiveness und safety

MFÄF relève le biais introduit dans cette évaluation par l'introduction de deux études de très mauvaise qualité, influençant par là-même les conclusions de l'étude. De ces deux études, MFÄF souligne en particulier celle du Prof. Buchbinder et al. en 2009. L'étude est controversée sur la forme, et sur la technique utilisée avec des biais de recrutements, d'indication à la vertébroplastie qui ne correspond pas à ce qui devrait se faire. De surcroît, il s'agit d'une technique inappropriée, qui revient en fait à considérer une comparaison entre une technique inusitée, n'ayant que peu de chance d'avoir un impact clinique et une technique placebo. On peut en conclure que deux techniques placebo ont été comparées. Il existe dans cette évaluation HTA (probablement ?) un net biais cognitif, certainement lié au fait que les auteurs soient Australiens.

Le courrier envoyé le 30 septembre 2019 s'avère toujours d'actualité (en pièce jointe du mail).

- *As above, the concerns regarding the inclusion of the Buchbinder 2009 and Kallmes 2009 studies were addressed using sub-group analysis and risk of bias appraisal.*
- *The authors declared no conflicts of interest at the start of the report.*

Kommentar zur gesundheitsökonomie

Kommentar zu ethischen, sozialen und legalen aspekten

Kommentar zu organisatorischen aspekten

Kommentar zu diskussion und schlussfolgerungen

Santésuisse

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

Der HTA- Bericht ist inhaltlich und methodisch gut aufgebaut und adressiert die relevanten Fragen. Nebst den für die politische Entscheidungsfindung wichtigen Grundlagen und Ergebnissen werden auch die methodischen Einschränkungen aufgezeigt. In den meisten Ländern werden diese Behandlungen bei schmerzhaften OVCF empfohlen, welche nicht oder ungenügend auf konservative Behandlung ansprechen. Demgegenüber ist in der Schweiz nur die Vergütung der PKB nicht aber der PVP limitiert. Aufgrund der unterschiedlichen Voraussetzungen für die Behandlungen (z.B. Restriktionen, Ein- Ausschlusskriterien) aber auch durch das teilweise abweichenden Behandlungssetting (ambulant - stationär) ist die Übertragbarkeit der Ergebnisse aus den internationalen Studien auf die Schweiz teilweise eingeschränkt. Ebenfalls wird die Heterogenität bei der regionalen Häufigkeit der Eingriffe in Betracht gezogen. Dieser Ansatz wird unterstützt. Die Studienfragen decken alle relevanten Bereiche der WZW-Beurteilung ab.

- *No amendment(s) required.*

Kommentar zu efficacy, effectiveness und safety

Die Erläuterungen zur Wirksamkeit und Sicherheit können nachvollzogen werden. Die Vergleiche zwischen PVP und PKB mit einer konservativen Behandlung sowie zwischen PVP und einer Scheinbehandlung ist gut aufgebaut. Wichtig ist die Erkenntnis aus der aktuellen Studienlage, dass mit der PVP im Vergleich zur konservativen Behandlung statistisch signifikante und klinisch relevante Verbesserungen von Schmerz oder Funktion aber keine klinisch relevanten Unterschiede im Vergleich zur Scheinbehandlung ausgewiesen werden können. Die Subgruppenanalyse basierend auf dem Alter des Knochenbruchs zwecks Erklärung der Heterogenität wird unterstützt. Diese Unterscheidung ist auch im Hinblick auf die gesundheitsökonomische Betrachtung relevant. Die Ausführungen zu den Risiken der Intervention werden unterstützt. Dabei verteilt sich der verwendete Knochenzement zum Teil mit einer hohen Wahrscheinlichkeit unkontrolliert. Diesbezüglich fehlen Informationen zu den langfristigen Risiken dieser Nebenwirkung.

- *No amendment(s) required.*

Kommentar zur gesundheitsökonomie

Das Gesundheitsökonomische Modell zur Bewertung des Kosten-Nutzen-Verhältnisses der Intervention im Vergleich mit dem Komparator wird umfassend erläutert. Der Modellaufbau und die Resultate können nachvollzogen werden. Die Lebensqualität der Intervention wird lediglich bei akuten Knochenbrüchen erhöht. Der entsprechende ICER für PVP und PBK liegt deutlich unter 100'000 Franken pro zusätzliches QALY. Die Modellberechnungen zeigen, dass mit sehr hoher Wahrscheinlichkeit beide Interventionen kosteneffizient sind. Diese Aussage gilt nur für akute Knochenbrüche. Die Analyse der Kostenfolge einer Streichung der Leistungspflicht ist plausibel.

- *No amendment(s) required.*

Kommentar zu ethischen, sozialen und legalen aspekten

Die entsprechenden ethischen, sozialen und legalen Aspekt können nachvollzogen werden.

- *No amendment(s) required.*

Kommentar zu organisatorischen aspekten

Die entsprechenden organisatorischen Aspekte können nachvollzogen werden.

- *No amendment(s) required.*

Kommentar zu diskussion und schlussfolgerungen

Die Diskussion und die Schlussfolgerungen sind plausibel. Die Studienresultate wurden gut zusammengefasst. Die Kernaussagen sind nachvollziehbar. Damit wurden die notwendigen Voraussetzungen für eine Beurteilung der Vergütung durch die OKP geschaffen. Es wäre hilfreich, wenn die Studienautoren eine entsprechende Empfehlung abgeben würden. Insbesondere interessiert, welche konkreten regulativen Massnahmen im Kontext des vorliegenden HTAs ergriffen werden sollten. Diese Empfehlungen sollten, wenn möglich international eingebettet werden. Insbesondere die Anwendung der PVP sollte auch in der Schweiz basierend auf den vorliegenden Studienresultaten entsprechend limitiert werden. Es wird vorgeschlagen, die PVP primär nur unter der Voraussetzung, dass der Patient konservativ austherapiert ist, über die OKP zu vergüten. Sekundär sollte diese Intervention nur bei akuten Knochenbrüchen zur Anwendung kommen.

- *It is beyond the scope of the HTA to produce recommendations for PVP and PBK.*
- *No amendment(s) required.*

Society of Interventional Radiology

Letter

RE: SIR comments to the SWISS HTA pertaining to Vertebroplasty or Kyphoplasty

The Society of Interventional Radiology (SIR) would like to thank you for considering percutaneous vertebroplasty (PVA), or percutaneous kyphoplasty (PKP), as a reasonable and medically necessary treatment for painful osteoporotic vertebral compression fractures unresponsive to non-surgical treatment.

- *No amendment(s) required.*

Efficacy and Safety

At one month, there were statistical and clinically meaningful differences between PVP and CT with respect to pain (mean difference [MD] -1.52; 95% confidence interval [CI] -2.86, -0.17; p = 0.03), Oswestry disability index (ODI) (MD -16.27; 95% CI -23.53, -9.01; p < 0.0001), and Roland-Morris Disability Questionnaire (RDQ) (MD -2.03; 95% CI -3.06, -1.01; p = 0.0002). These results remained statistically different at 12 months. However, the results were subject to considerable heterogeneity, and the differences did not surpass the lower bounds of identified minimum clinically important differences (MCIDs). Consequently, the results were not considered clinically relevant.

There are numerous examples like this that had statistically significant improvements in pain and function that were profound and durable out to one year. Still, then a predefined MCID is applied, followed by the conclusion that the results are not clinically relevant. So how are the reviewers taking precisely what has to be clinically relevant by the authors and making it not clinically relevant? Who decides to overturn what the clinician-researchers have determined to be decidedly clinically relevant, and state data calculations outside the study make it not clinically relevant? These examples are everywhere though the HTA and are not representative of the original clinical data, nor are they an appropriate clinical assessment of the efficacy of Vertebroplasty or Vertebral Augmentation.

- *The results of the HTA are informed by synthesis of the published literature. To differentiate between a statistically significant result and a clinically relevant result (when only using published literature) MCIDs are required. These tools are particularly important when considering subjective outcomes such as patient-reported pain.*
- *MCIDs aid in determining whether a reported change is noticeable and meaningful to the patient and therefore warrants a change in clinical practice. Without the use of MCIDs, it is unclear whether, for example, a 1-point reduction in a 10-point scale is perceptible to the patient and requires a change in practice.*
- *Concerns regarding the applicability of the MCIDs in the HTA are highlighted in the Executive Summary, Discussion and Section 17.5.*

Cost-effectiveness of Vertebral Augmentation

The most informative data on the cost-effectiveness of vertebral augmentation is derived from retrospective analyses of large patient populations (1-6). A review of this retrospective literature, while somewhat limited in sample size and breadth of scope, does indicate that vertebral augmentation is more cost-effective when compared to non-surgical management (NSM) (7-10). This is particularly apparent when the mortality benefit of vertebral augmentation is included in this cost-analysis.

Cost-effectiveness models comparing vertebral augmentation to non-surgical management have also been performed and calculated that the cost-per-life-year gained ranged from $US1,863 to $US13,543 for vertebral augmentation (6). A cohort study from the United Kingdom looked at patients hospitalized for vertebral compression fractures (VCFs) and found that the cost per Quality-Adjusted Life Year of kyphoplasty versus vertebroplasty was 19,706€ and concluded that kyphoplasty might be more cost-effective than both non-surgical management (NSM) and vertebroplasty (7). If one simply looks at health-care-dollars-expended, NSM may appear more cost-effective, but when factoring the cost-effectiveness benefits of improved quality of life and reduced mortality gained from vertebral augmentation, vertebral augmentation is clearly shown to be more cost-effective than NSM (7). A

prospective multicentre study from Sweden that lacked some of these adjustments and included only 63 patients failed to show the cost-effectiveness of kyphoplasty and computed an outrageously high cost-per-quality-adjusted-life-year of $US 134,000 (8).

Borgström conducted a systematic analysis of peer-reviewed investigations of the cost-effectiveness of vertebral augmentation in patients with vertebral compression fractures and osteoporosis (9). When compared to non-surgical management, vertebral augmentation was found to be cost-effective in 3 of the five studies reviewed. Incremental cost-effectiveness ratios ranged from €3,337 to €92,154 (US$ 3799 to US$ 104,914) in 4 out of the five studies analysed (9). Variations in cost-effectiveness were most affected by the time-horizon of the study, time to realization of treatment effect, the effect of treatment on quality of life, reduction in length of stay, and mortality after vertebral augmentation (9).

A cost analysis using Medicare claims from January 2005 to December 2008 in the US found that the vertebral augmentation for the treatment of vertebral compression fractures proves once again to be cost-effective (10). In this analysis, while all forms of vertebral augmentation proved cost-effective, kyphoplasty could impart more cost savings when compared with vertebroplasty. The differences in cumulative median costs for vertebroplasty and kyphoplasty compared with non-operative management were $US8,300-$US28,820 for vertebroplasty and $US12,580-$US18,500 for kyphoplasty (10). These results were dependent on age and gender. The cost-per-life-year-gained for kyphoplasty compared with NSM was $US1,863-$US6,687, and the cost-per-life-year-gained for vertebroplasty compared with NSM was $US2,452-$US13,543 (10). The cost-per-life-year-gained, when comparing kyphoplasty versus vertebroplasty, was $US284-$US2,399 for females and $US2,763-$US4,878 for males (10). These findings clearly indicate a lower cost-per-life-year-gained for kyphoplasty. Some variables, including the cost of equipment and cost of the hospital, vary greatly depending on the manufacturer, the location of the hospital, and the comorbidities of each patient. In addition, the lost work hours and the family cost of care to each patient is not represented and represent additional cost-saving when appropriately taken into account.

A retrospective study written by Masala et al. showed that percutaneous vertebroplasty in patients with osteoporotic vertebral fractures was more cost-effective than NSM (11). In the European Union, vertebral fractures are responsible for 8% of the hospital costs of all osteoporotic fractures, and the hospital cost of a vertebral fracture treated by NSM is approximately 63% of the mean hospital cost of a femoral fracture (11). In a patient population of 153 patients, 58 of which underwent percutaneous vertebroplasty (PVP) and 95 underwent non-surgical management (NSM), Masala found PVP to be superior in outcome effectiveness, cumulative costs and overall cost-effectiveness at one week, three months and twelve months post-procedure (11). Cost-effectiveness was measured as the average cost per patient per reduction of one point on a reduction of pain (VAS) or improvement in the activities of daily living (ADL) scale. Costs were evaluated for each group by adding hospital care costs to all outpatient costs. Percutaneous vertebroplasty (PVP) was more cost-effective at all three-time points, statistically significant in all three categories at one week, and statistically significant for improved ADL scale at three months. It was also associated with earlier pain reduction, improvement of ambulation, and improvement of the ability to perform daily living activities in the short and long term. The factors that most influenced cost were days of hospitalization, physical therapy, and the back brace for the NSM group. In the PVP group, costs were mainly affected by the hospital expenses of the procedure (11). Masala et al. concluded that the improved clinical outcomes, along with the lower cost-effectiveness ratio of PVP in the short-term and its comparable cost-effectiveness ratio with that of non-surgical management (NSM) in the long-term make PVP a preferable procedure to NSM (11).

- *The conclusions of the current HTA and existing literature are broadly congruent: vertebroplasty and kyphoplasty are cost-effective when compared to CT.*
- *It is acknowledged that existing studies utilised different inputs, sources and assumptions in their models. However, mortality gains were not considered in the present HTA because the included RCTs found no significant difference between treatment groups with respect to mortality. Using lower forms of evidence (non-randomised controlled trials or historical comparisons) introduces additional bias, confounding, applicability and assumption concerns when considering the economic analysis. Costs associated with hours lost and family care costs*

were not considered owing to the absence of published literature evaluating these factors in Switzerland.

When dealing with metastatic disease and vertebral pathologic compression fractures, there is even less long term prospective data than with osteoporotic vertebral compression fractures (VCFs). The best literature review is by the Health Quality Ontario assessment done in May 2016 (12). The objective of the Ontario analysis was to determine the cost-effectiveness and budgetary impact of kyphoplasty or vertebroplasty compared with non-surgical management (NSM) for the treatment of VCFs in patients with cancer.

Upon completing a systemic review of health economic studies, they performed a primary cost-effectiveness analysis to assess the clinical benefits and costs of kyphoplasty or vertebroplasty compared with non-surgical management in the same population from published sources. They also performed a 1-year budget impact analysis using data from Ontario administrative sources. They found that kyphoplasty and vertebroplasty used in patients with cancer may be a cost-effective strategy at commonly accepted willingness-to-pay thresholds (12).

- *Evaluating PVP and PBK in patients with metastatic disease and pathologic compression fractures were beyond the scope of the HTA.*

In conclusion, vertebral fractures are extremely common in patients over 50 years of age, especially in patients with osteoporosis and metastatic cancer. The overall review of the literature supports vertebral augmentation as a cost-effective method that is superior and more cost-effective than non-surgical management in patients with vertebral compression fractures. Some of the major influences are the decreased length of stay and the overall lower rate of narcotic usage over time.

- *As above, the conclusions of the current HTA and existing literature are broadly congruent. No amendment(s) required.*

Stakeholder feedback

- *The stakeholder feedback was a repeat of the letter. The concerns raised are addressed above.*

Allgemeiner kommentar zum HTA-Bericht

There are numerous examples like this that had statistically significant improvements in pain and function that were profound and durable out to one year but then a predefined MCID is applied followed by the conclusion that the results are not clinically relevant. So how are the reviewers taking precisely what has to be clinically relevant by the authors and making it not clinically relevant? Who decides to overturn what the clinician researchers have determined to be decidedly clinically relevant and state data calculations outside the study make it not clinically relevant? These examples are everywhere though the HTA and are not representative of the original clinical data nor are they an appropriate clinical assessment of the efficacy of Vertebroplasty or Vertebral Augmentation.

Kommentar zu efficacy, effectiveness und safety

Percutaneous Vertebroplasty

At one month, there were statistical and clinically meaningful differences between PVP and CT with respect to pain (mean difference [MD] -1.52; 95% confidence interval [CI] -2.86, -0.17; $p = 0.03$), Oswestry disability index (ODI) (MD -16.27; 95% CI -23.53, -9.01; $p < 0.0001$), and Roland-Morris Disability Questionnaire (RDQ) (MD -2.03; 95% CI -3.06, -1.01; $p = 0.0002$). These results remained statistically different at 12 months. However, the results were subject to considerable heterogeneity and the differences did not surpass the lower bounds of identified minimum clinically important differences (MCIDs). Consequently, the results were not considered clinically relevant.

Kommentar zur gesundheitsökonomie

Cost-effectiveness models comparing vertebral augmentation to non-surgical management have also been performed and calculated that the cost-per-life-year gained ranged from $US1,863 to $US13,543 for vertebral augmentation (6). A cohort study from the United Kingdom looked at patients hospitalized for vertebral compression fractures (VCFs) and found that the cost per Quality Adjusted Life Year of kyphoplasty versus vertebroplasty was 19,706€ and concluded that kyphoplasty may be more cost-effective than both non-surgical management (NSM) and vertebroplasty (7). If one simply looks at health-care-dollars-expended, NSM may appear more cost-effective, but when factoring the cost-effectiveness benefits of improved quality of life and reduced mortality gained from vertebral augmentation, vertebral augmentation is clearly shown to be more cost-effective than NSM (7).

Kommentar zu ethischen, sozialen und legalen aspekten

Upon completing a systemic review of health economic studies, they performed a primary cost-effectiveness analysis to assess the clinical benefits and costs of kyphoplasty or vertebroplasty compared with non-surgical management in the same population from published sources. They also performed a 1-year budget impact analysis using data from Ontario administrative sources. They found that kyphoplasty and vertebroplasty used in patients with cancer may be a cost-effective strategy at commonly accepted willingness-to-pay thresholds (12).

Kommentar zu organisatorischen aspekten

A cost analysis using Medicare claims from January 2005 to December 2008 in the US found that the vertebral augmentation for the treatment of vertebral compression fractures proves once again to be cost-effective (10). In this analysis, while all forms of vertebral augmentation proved cost-effective, kyphoplasty could impart more cost savings when compared with vertebroplasty. The differences in cumulative median costs for vertebroplasty and kyphoplasty compared with non-operative management were $US8,300-$US28,820 for vertebroplasty and $US12,580-$US18,500 for kyphoplasty (10). These results were dependent on age and gender. The cost-per-life-year-gained for kyphoplasty compared with NSM was $US1,863-$US6,687, and the cost-per-life-year-gained for vertebroplasty compared with NSM was $US2,452-$US13,543 (10). The cost-per-life-year-gained when comparing kyphoplasty versus vertebroplasty was $US284-$US2,399 for females and $US2,763-$US4,878 for males (10).

Kommentar zu diskussion und schlussfolgerungen

In conclusion, vertebral fractures are extremely common in patients over 50 years of age, especially in patients with osteoporosis and metastatic cancer. The overall review of the literature supports vertebral augmentation as a cost-effective method that is superior and more cost-effective than non-surgical management in patients with vertebral compression fractures. Some of the major influences are the decreased length of stay and the overall lower rate of narcotic usage over time.

Swiss MedTech

Letter

Dear Ladies and Gentlemen,

We refer to the report on the Health Technology Assessment (HTA) regarding “Vertebroplasty or Kyphoplasty in Painful Osteoporotic Vertebral Compression Fractures Unresponsive to Non- Surgical Treatment »and hereby submit our stakeholder statement to you.

Swiss Medtech generally welcomes the efforts of the FOPH to keep costs down in the health care system Health Technology Assessments (HTAs) to be carried out in order to meet the obligation potentially obsolete medical therapies and procedures within the framework of compulsory basic insurance to check.

First of all, however, we cannot avoid three specific notes about our input and the present one To submit HTA proceedings:

- The stakeholder consultation took place on the one hand during the holiday season. On the other hand, we were made for that Answering a report - which took several months to create - granted only 20 days. It should therefore be noted that the stakeholders face the scope and complexity of the report, far too little time is given to Submit serious answers, which in turn leads to questions related to the fairness of the process connected is.
- The report is over 300 pages long. It is not possible to stay with the To keep the answers short, which is why our feedback has also become very detailed. Questionable is in general that there is a character restriction in the official form. There this limitation only allowed very short comments, we decided to add to draw up a detailed substantive statement that will be used in the evaluation of our Stakeholder input has to be taken into account. We therefore ask you to provide this document, which is structured in the same way as the official form, as it is next to more detailed explanations also references to the corresponding places in the HTA as well as references for our includes finishes.
- We regret the writing style owed to the character limitation and hope that you will use it do not perceive the resulting tone of voice as inappropriate; this is not our goal. Due to the clear aim of HTAs to disinvest, especially in the re-evaluation program the process from the choice of topic to the decision-making process is transparent, regardless of political interests and evidence-based.

At the HTA on the subject of “Vertebroplasty or Kyphoplasty in Painful Osteoporotic Vertebral Compression” Fractures Unresponsive to Non-Surgical Treatment ”was, in our opinion, insufficient considered. We are concerned with the prioritization of topics, the choice of the authors and reviewers involved in this HTA, as well the method paper on which the report is based does not make it clear why we are asking you about this ask for transparency. The following questions in particular need to be clarified and the corresponding ones

Documents to be disclosed:

- In the present case, in particular, ensuring that the HTA is carried out independently made more difficult by the fact that the issue was reviewed by the BAG itself on October 31, 2017 was entered. We therefore ask ourselves on what database the issue from the BAG was selected. Has the budget relevance been sufficiently clarified e.g. based on case numbers and - cost compared to the alternative treatment? Where is the limit of the proportionality of a HTAs drawn against resource consumption?
- Has the project been awarded in a public invitation to tender (in terms of the submission right) took place?
- Which HTA agencies applied for the contract or were invited, and based on what criteria was the assignment assigned to the current authors?
- Was there a possible conflict of interest of the contractor with a view to the carried out and Current HTA evaluation on vertebroplasty in Australia excluded?

- Which method paper was the drafting of the HTA followed and where is this stipulated? Are there binding international guidelines for the contractors? Had to the authors keep a pre-determined “specification sheet”?
- Who are the reviewers in this HTA, from which specialist groups / organizations come they and what qualifications were they selected for? Became a conflict of interest locked out?
- For the sake of transparency, we would like to see the review documents for the scoping report and HTA draft as well as in the protocol for decision-making, based on the scoping Create HTA.

- *The questions raised by Swiss MedTech are beyond the scope of the HTA report and will not be addressed.*

Overall, the present HTA gives the impression that the BAG is already making an entry of the topic anticipated the conclusions on the issue in the HTA. That the Expert report from August 24, 2017 on cost-containment measures on page 41 bold and states without reference to the source that vertebroplasty and kyphoplasty are "expensive interventions, (...) which, based on evidence, do not bring any additional benefit compared to conservative therapy ». One Possible governance problems on the part of the BAG would have counteracted all the more carefully from the start need to become. In fact, other stakeholders besides us also have imbalanced comparisons and are hasty conclusions drawn in the scoping report from September 2019 criticized. Methodological weaknesses as well as the partly tendentious interpretation of the results in the present HTA report (for details see feedback documents) leave doubts about the impartiality of the authors and about whether the reports have been scientifically reviewed by qualified, independent experts.

As can be seen from our feedback documents, we particularly criticize the health economic ones. Calculations based on sources that cannot be verified and are incomprehensible Assumptions are based, so that the cost relevance / impact is shown massively distorted. Moreover we find that positive results with scientifically dubious evaluation analyses to be veiled.

Furthermore, we would like to ask again for a better involvement of the affected stakeholders, which was also requested by several associations during the stakeholder workshop on June 26, 2019 has been. Various hurdles in the HTA process indicate that a scientifically sound Feedback from the stakeholders in this HTA is not desired, or such feedback has even been counteracted, see the following examples:

- Stakeholder feedback was not published due to formal errors
- The well-founded criticism in the scoping report was not sufficiently addressed
- The possibility or the scope of commenting on the HTA report of around 300 A4 pages, is kept to a minimum
- A scientific review by stakeholders is explicitly rejected the time window for the re-registration is - as mentioned - placed in the holiday season (Switzerland-wide School holidays) and this despite the confirmation of November 11, 2019 that official holidays are taken into account would. We would therefore like to ask you to contact us as a token of appreciation of legitimate stakeholder concerns invite an open conversation (physical or virtual), in which the above points clarified with regard to this specific HTA procedure, as well as our feedback on the content of the HTA report can be heard and discussed together.

Supplementary Document

In addition to the stakeholder feedback document provided by Swiss MedTech, the FOPH received a supplementary document with additional feedback. The over-arching comments provided in supplementary document were responded to below.

Concerns Regarding the Use of MCIDs

- *The results of the HTA are informed by a synthesis of the published literature. To differentiate between a statistically significant result and a clinically relevant result (when only using published literature), MCIDs are required. These tools are particularly important when considering subjective outcomes such as patient reported pain or mobility levels.*
  MCIDs aid in determining whether a reported change is noticeable and meaningful to the patient and therefore warrants a change in clinical practice. Without the use of MCIDs, it is unclear whether, for example, a 1-point reduction in a 10-point scale is perceptible to the patient and requires a change in practice.
- *Concerns regarding the applicability of the MCIDs in the HTA are highlighted in the Executive Summary, Discussion and Section 17.5.*

Concerns Regarding the Inclusion of Sham Trials

- *In order to ascertain the true effect of an intervention, placebo/sham trials are required. This is pertinent for procedures that have a history of mixed results. By utilising a blinded sham procedure, the effects of the patient-provider relationship, treatment ritual and confounding treatments (e.g. nerve block/local anaesthetic) are minimised enabling the researcher to elucidate the true treatment effect. If sham trials were not included, it would be unclear whether the procedure was masking a placebo effect.*

Concerns Regarding the Quality of Life Outcomes

- *The included RCTs generally used reduction in pain scores as the basis of their power calculations because pain is the primary symptom of OVCFs. Consequently, RCTs generally focussed on pain rather than quality of life outcomes.*
- *In the HTA report, equal weighting was given to pain and quality of life outcomes (as reflected by the PICO and GRADE tables). (The title emphases the role of pain as that is the predominant symptom of vertebral fracture and pain is a requirement for PBK reimbursement in Switzerland.) It is acknowledged that quality of life outcomes had a smaller sample size relative to pain outcomes. This adds uncertainty to the result (as reflected in the GRADE summary of findings tables) but it does not justify excluding them from the HTA report.*

Concerns Regarding the Applicability of the Evidence Base

- *Several RCTs do not explicitly state whether patients failed CT, thus their inclusion criteria does not align with one aspect of the PICO. However, there are no reimbursement restrictions for PVP in Switzerland. Trials which do not mention CT failure, still broadly align with current reimbursement practices (noting, the clinical situation may differ) and other aspects of the PICO. This is a limitation of the evidence base, but it does not necessitate their exclusion from the HTA. Section 7.6.1 Applicability for PVP has been updated to reflect concerns regarding whether patients failed CT.*

Concerns Regarding the Economic Model

- *The conclusions of the current HTA and existing literature are broadly congruent: vertebroplasty is cost-effective when compared to CT.*
- *The data for vertebroplasty and kyphoplasty were sourced using CHOP codes (7A.4, 7A.40, 7A.41, 7A.42, 7A.43, 7A.44, 7A.49, 81.66, 81.66.00, 81.66.99, 81.66.11, 81.66.12, 81.66.13, 81.66.10, 81.65, 81.65.11, 81.65.00, 81.65.10, 81.65.99, 81.65.12, 81.65.13) and the cost weights were obtained from the following source:*
  - *https://datenspiegel80.swissdrg.org/drgs/5ba4b5e23bba1e5e8056aff7?locale=de*

- *There was limited information regarding typical outpatient costs associated with the procedures. It was assumed most of the work-up and follow-on costs are the same for intervention and comparator arms with the cost per physiotherapy visit sourced from the FOPH. There was also limited Swiss-specific information that could be used to infer secondary costs associated with PVP and PBK. To limit the number of assumptions and uncertainty associated with the model, additional care was limited to physiotherapy.*
- *It is acknowledged that existing studies utilised different inputs and assumptions in their models. However, mortality gains were not considered in the present HTA because the included RCTs found no significant difference between treatment groups with respect to mortality. Using lower forms of evidence (non-randomised controlled trials or historical comparisons) introduces additional bias, confounding, applicability and assumption concerns and ultimately were unlikely to alter the conclusion of the economic model.*

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

We welcome the opportunity to review and comment on the draft HTA.

The conduct is methodologically questionable: key research questions are not adequately addressed. Please consider revising the draft before using it to inform a decision that may deprive patients of effective and safe procedures, to significantly reduce debilitating pain and decrease mortality, as demonstrated in this assessment. Any financial impact would be insignificant (see 3.). Uncertainty on methodology, perceived systematic misrepresentation and misinterpretation of evidence, e.g.

- failure to specifically address patient groups as defined in PICOs
- non-verifiable data and cost projections
- unvalidated MCIDs and conclusions already drawn at scoping phase, give us serious reason to believe that significant clinical benefits for PVP and PBK are being underestimated.

The overall process does not give the impression of a balanced assessment – for further details please see accompanying letter.

- *Concerns regarding the applicability of the patient population, MCIDs and the cost of the procedure were addressed in the responses provided above.*

Kommentar zu efficacy, effectiveness und safety

Only 2 RCTs fully meet the respective PICOs: Farrokhi, Voormolen. Additional subgroup analysis and/or inclusion of newly available evidence such as level 1 studies may help overcome this limitation and the often-commented heterogeneity of evidence.

The report considers QoL measures over pain, despite medical consensus that pain is the key indicator for PVP/PBK as well as main outcome of PICO reported in this assessment. Pain reduction is the primary endpoint in almost all RCTs, while likely to be underpowered to reveal significant differences in QoL measures (secondary endpoints).

- *The lack of studies explicitly stating whether patients failed CT does not warrant their exclusion from the HTA. Rather, these concerns are discussed in Section 7.6 (Applicability) of the report.*
- *The HTA does not report quality of life measures over pain; both outcomes were considered critical when appraised using GRADE.*

As appreciated in earlier Swiss HTAs and here, the application of MCIDs is constrained to individual patient level data and must be critically examined before assessing research results. Considering their uncertain validity in OVCFs, unbalanced statements in the executive summary give the impression that MCIDs are misused to conceal statistically significant results.

- *The executive summary has been amended to highlight the uncertain applicability of MCIDs. The MCIDs were not used to conceal statistically significant results, rather they were used to aid in their interpretation.*

We perceive the evidence on mortality is insufficiently reflected and would ask to consider a recent meta-analysis revealing that PVP/PBK vs CT reduce mortality by 22% at up to 10 years (Hinde et al. 2020). Though available evidence indicates a favourable trend towards PVP/PBK, heterogeneity of evidence does not allow to conclusively inform on outcomes of PVP/PBK in the specified patient group, more solid research is needed.

- *Many of the studies in Hinde (2020) were already included in the current HTA (including the most heavily weighted trial in their analyses [Ong 2018]). Therefore, the addition of Hinde (2020) is unlikely to alter the conclusions of the report.*

Kommentar zur gesundheitsökonomie

We ask you to revise the budget impact analysis (BIA) as the expected budget impact for delisting PVP/PBK is significantly reduced to saving max. 0.47 Mio CHF: Annual costs for PVP/PBK decreased since 2013 due to reimbursement reductions. The assumed # of cases differ significantly from official data by BFS for 2018 on PVP/PBK as main procedure (4'175 vs. 2'591) The BIA doesn't include all identified main cost driver for CT group (outpatient physiotherapy). Follow-up costs play a considerable role in OVCF treatment, these should be accurately represented. Mortality data from database registries per PICOs as considered should also be included in ICER calculation. The dual financing scheme in Switzerland (45% health insurances vs 55% Canton) seems to be neglected despite focus on health insurance perspective only. Patients who are refractory to CT may, in the absence of PVP/PBK, require more invasive surgical treatments that are potentially more costly and lead to adverse events.

- *Concerns regarding the economic model have been addressed in the responded provided above.*

Kommentar zu ethischen, sozialen und legalen aspekten

Besides to the moral obligation to relieve acute pain it is widely recognized that chronic pain is a major risk factor of depression, especially in the elderly. Also, people with spinal fractures are at increased risk of complications and death (Lindsay 2001). PVP/PBK have shown to effectively reduce pain while having a favourable safety profile in this vulnerable and often multimorbid patient group. For patient's refractory to/ineligible for CT, PVP/PBK are the only safe and effective treatment options.

Patients treated by PVP/PBK vs CT recover faster, are twice more likely to be discharged to home vs a nursing facility, remain more independent and continue to use less nursing resources from family and facilities (e.g. Klezl 2012, Zampini). Risk of mortality is reduced by 22% for PVP/PBK vs CT for up to 10 years (Hinde et al. 2020).

We kindly ask you to consider that the requirement for out of pocket payments may lead to inequality of access to a life improving and prolonging therapy.

- *The concerns around loss of independence, increased nursing home care and mortality are addressed in the HTA (see Sections 7, 10 and 11, respectively). Concerns regarding healthcare inequality were addressed in Section 11.4.2 "However, individuals with limited financial means may be unable to afford the procedure if the service becomes fee-paying. Thereby limiting their access to the procedure".*

Kommentar zu organisatorischen aspekten

To our knowledge there is no discordance among physician's associations in CH with regards to the value of PVP/PBK in OVCFs, nor of any health insurance denying reimbursement. Considering the lack of controversy in CH, the repeated endorsement of PBK by the ELGK and the minimal if at all positive economic impact of a potential disinvestment of PVP/PBK, the ongoing funding of this procedure should remain.

The conclusion of this HTA is unbalanced and may result in underutilization of these safe and effective treatments, which in turn may put patient's lives at risk if they are no longer adequately treated, similarly to what has been observed in the US (Ong 2019).

New clinical guidelines are expected soon by Swiss professional societies, please accept the inclusion of PVP/PBK in the mandatory SIRIS spine registry from 01/2022 as an opportunity to collect local real world data, identify patients that benefit most, and hence, allow for an informed decision-making.

- *The HTA has been updated to include the CHUV and the SVGO publications (see Section 3.4 and 13). The executive summary and discussion have been updated to include a statement regarding the SIRIS Spine registry.*

Kommentar zu diskussion und schlussfolgerungen

We question whether the HTA sufficiently addresses the specific patient group as defined in PICOs.

Despite uncertainties, the clinical outcomes demonstrate PVP/PBK vs CT have a favourable efficacy and safety profile when analysed across a widely heterogenous patient population. In view of missing OVCF-specific MCIDs, generalized conclusions on the lack of clinical relevance of the positive data are questionable.

Pain was the primary endpoint in almost all RCTs included, please consider pain for deriving utility gains for ICER calculation of PVP/PBK vs CT. We appreciate the body of evidence on reduced mortality for PVP/PBK vs CT to be considered as well. This approach was established for the independent NICE TA 279 (positive reimbursement decision of PVP/PBK in UK, last confirmed 2016).

For the reasons outlined, we would highly appreciate the HTA to be scrutinized for systematic bias and obtain transparent and independent expert review in order to undergo essential revisions.

- *Using pain to derive utility gains requires additional assumptions and adds further uncertainties to the economic model when compared with quality of life measures.*
- *Concerns regarding the applicability of the patient population, MCIDs and model inputs were addressed above.*

Swiss Society of Neurosurgery, Swiss Orthopaedics, Swiss Society of Neuroradiology, Swiss Society of Spinal Surgery

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

The report is a summary of the scientific evidence on vertebral augmentation. It tries to provide an estimate of clinical and cost effectiveness and addresses social, legal and ethical considerations. The authors repeatedly mention the issues of heterogeneity of the results, the weaknesses of the studies available and base their arguments on the 2009 Buchbinder paper and the 2018 Cochrane report; 2 studies that have been criticized by the scientific spine community for their lack of objectivity and misinterpretations.

Considering the difficulties of performing RCT's in pharmacological research it is revealed that this is even more complex in surgical procedures. We are dealing with geriatric patients from whom it is difficult to obtain relevant outcome measures. It thus appears futile to perform all possible analyses and expect frank results. There are serious studies (VAPOUR) available that confirm the clinical experience of treating patients with vertebral fractures.

- *The comments do not require amendments to the HTA report.*

Kommentar zu efficacy, effectiveness und safety

To judge the efficacy and effectiveness of a procedure it must be evaluated in a representative patient population. Contemporary knowledge provides limited evidence on the efficacy and effectiveness of vertebral augmentation. The study populations are not representative of all kinds of problems faced in daily clinical work. Overall, there is scientific evidence that patients with acute fractures or persistently high pain scores after conservative treatment benefit most from cement augmentation techniques, allowing them to get out of bed immediately, thereby avoiding the risks of prolonged bedrest (i.e. reducing the high complication rate especially in geriatric patients) and enabling early patient discharge. In the judgement of the "efficacy" the authors agree on the difficulty about the MCID.

The safety of the procedures has reached a high reliability; optimized cements, improved applications techniques and imaging allow to perform a low-risk intervention.

- *The comments do not require amendments to the HTA report.*

Kommentar zur gesundheitsökonomie

The report that PVP does not fulfil the criteria of cost effectiveness based on Buchbinder data is puzzling. The assumption that the Buchbinder data is representative of Switzerland is not acceptable; other weak points of the study have been discussed thoroughly. The data of the VERTOS II and VAPOUR trials come to different conclusions. Such statements reflect the authors' lacking clinical background.

- *At the time of writing the report, there were no limitations governing the reimbursement of PVP. Patients with older fractures could access PVP and consequently, it was deemed appropriate to include studies which also considered older fractures (Buchbinder 2009 and Kallmes 2009 trials).*
- *It is acknowledged that clinical practice may differ from the literature. To provide (potentially) more clinically relevant results, the clinical and economic analysis also delineated fractures >8 weeks and <8 weeks old (VERTOS II and VAPOUR trials).*

The estimate of overall savings by delisting the procedures is wrong. In 2017 & 2018 ca. 2500 procedures were performed per year; the projection of nearly 5000 for 2020 is exaggerated and tendentious. The numbers in fig 45 of the report are false considering the CHOP codes of the BFS!

- *The data for vertebroplasty and kyphoplasty were sourced using CHOP codes (7A.4, 7A.40, 7A.41, 7A.42, 7A.43, 7A.44, 7A.49, 81.66, 81.66.00, 81.66.99, 81.66.11, 81.66.12, 81.66.13,*

81.66.10, 81.65, 81.65.11, 81.65.00, 81.65.10, 81.65.99, 81.65.12, 81.65.13) and the cost weights were obtained from the following source:

- https://datenspiegel80.swissdrg.org/drgs/5ba4b5e23bba1e5e8056aff7?locale=de

Thus, the calculations of the potential savings are invalid. The non-hospital costs for patients with conservative treatment are not clearly explained and failures of conservative treatment are not estimated either. Costs related to social dysfunction with referrals in nursing homes are not clearly listed.

- *CT, PVP and PBK were costed using hospital DRGs. The work-up and follow-on procedures were assumed to be the same for each.*
- *No literature was identified reporting on the costs associated with social dysfunction following PVP, PBK or CT in Switzerland. Attempts to infer the costs associated with social dysfunction without identified literature would add further uncertainty to the model.*

Kommentar zu ethischen, sozialen und legalen aspekten

The role of cement augmentation in the treatment of vertebral fractures has not been questioned by the specialists taking care of these patients, regardless of their clinical background!

- *The American Academy of Orthopaedic surgeons do not recommend the use of PVP which is conflict with other guidelines and position statements from America and Europe.*

If we give up PVP and BKP we deprive patients of one of the most efficient treatment options. We expose them to more pain and put them at risk of complications directly related to the fracture (i.e. spinal instability, neural compression, paralysis) which in turn will require very more costly and invasive measures. In the VAPOUR trial neurologic complications are reported as 3%. For Switzerland this means about 80-100 cases annually.

It has been shown that the social dysfunction with conservative fracture treatment is related to loss of independence, increased demand of nursing home care and higher mortality!

There are concerns of desocialization if the delisting is realized: the treatment can be performed on patients who can afford it, whereas poorer people are no longer able to access the treatment.

- *The concerns around loss of independence, increased nursing home care and mortality are addressed in the HTA (see Sections 7, 10 and 11, respectively). Concerns regarding healthcare inequality were addressed in Section 11.4.2 "However, individuals with limited financial means may be unable to afford the procedure if the service becomes fee-paying. Thereby limiting their access to the procedure".*

Kommentar zu organisatorischen aspekten

It is a privilege to be part of the decision-making process and to be allowed to represent the patients' interests. It appears especially important that the whole process goes beyond an isolated obstinate pooling and calculation of scores and numbers.

We have concerns regarding the composition of the authorship. This HTA report has been written by a group of scientists of the Royal College of Surgeons in Adelaide. None of the contributing authors has a clinical background in the field of spine, let alone in the treatment of vertebral fractures.

Australia is, alongside the Netherlands, the only country that has delisted PVP and BKP. There appears to be a bias in the estimate of the uncertainties that are present without any doubt due this isolated viewpoint and lack of clinical background.

This project lasts for more than one year. It is thus inappropriate that the BAG provides the report during the summer holidays with a feedback deadline of 4 weeks.

- *The authors have declared no conflicts of interest.*

- *The purpose of the HTA is to summarise the results from published literature. It is acknowledged this approach may omit certain aspects associated with clinical practice. These limitations do not invalidate the HTA process or the conclusions of the report.*

Kommentar zu diskussion und schlussfolgerungen

The authors discuss the current scientific knowledge in the field of PVP and BKP for osteoporotic compression fractures. Their analysis appears sound and serious. There are numerous pitfalls in all studies presented and the results can be interpreted differently depending on the viewpoint.

For clinicians, PVP and BKP as minimal invasive treatment options represent some of the most efficient tools in spine surgery. They are accepted options for severely painful patients with acute fractures and yet there is no mention by the authors in this report. The Schweizerische Vereinigung gegen Osteoporose lists the procedures in their 2015 recommendations.

Also, a common guideline for the treatment of vertebral compression fractures is under development by an interdisciplinary group involving all subspecialties involved in vertebral fracture treatment.

Finally, it must be emphasized that in Australia the responsible bodies (MSAC) have supported the relisting of vertebroplasty (June 2020).

- *Section 13 has been updated to reflect the position statement by SVGO. It is acknowledged MSAC has relisted PVP in 2020, this is flagged in the comments above and in the policy question in the HTA.*

The Swiss Society of Vascular and Interventional Radiology

Stakeholder Feedback

Allgemeiner kommentar zum HTA-Bericht

Regarding benign (osteoporotic) fractures, many studies comparing vertebroplasty/kyphoplasty versus conservative treatment are methodologically different and thus results vary considerably leading oftentimes to divergent conclusions and more importantly confusion among referring physicians. Often studies looked at long-term follow-up 12 months or longer as their endpoint. For these typically older patients even a short-term benefit of 1-3 months could be very important.

As a result, it is very challenging to propose recommendations on the role of vertebroplasty/kyphoplasty with a high degree of certitude.

- *It is acknowledged shorter time points may be more relevant to older adults. However, there was insufficient evidence to perform sub-group analysis on the patient's age.*

Kommentar zu efficacy, effectiveness und safety

It appears that vertebroplasty/kyphoplasty is effective in non-consolidated vertebral fractures, most notably those undergoing treatment within 6-8 weeks. Moreover, prior to treatment, we believe that it is imperative to systematically confirm that any vertebroplasty/kyphoplasty candidate still presents a non-consolidated fracture using MRI or any other imaging modality that shows worsening of the angle of kyphosis or vertebral body compression. Typical MRI features correlate very well with the outcome after vertebroplasty (1), therefore a non-contrast MRI is helpful to select the right patient for vertebroplasty. Currently, there is no consensus on the safety profile of Vertebroplasty vs Kyphoplasty. Also, there is not enough data to support the fact that cement leakage, more oftentimes occurring in Vertebroplasty, is associated with an increased risk of long-term complications.

1. Luis A´ lvarez et al., Spine 2005;30:87–92

- *The use of imaging to confirm the presence of a fracture is noted in Section 3 of the HTA.*
- *An assessment comparing the relative safety of PVP vs PBK is beyond the scope of the HTA.*

Kommentar zur gesundheitsökonomie

We agree with the statements regarding the healthcare costs of Vertebroplasty and Kyphoplasty. Additionally, there is no available data showing the superiority of one technique over the other (Vertebroplasty vs Kyphoplasty) in terms of patient outcome and safety. If the costs related to one technique is significantly greater than the other because of difference in equipment used, said technique must be justified ideally using RCT which clearly demonstrates superiority in terms of efficacy and safety.

- *The relative effectiveness of PVP vs PBK is beyond the scope of this HTA.*

In order to save overall costs vertebroplasty and/or kypho-stentoplasty can potentially done as an outpatient procedure. At the Kantonsspital Winterthur vertebroplasty procedures were done in outpatient setting in 61% (2018) and 53% (2019) of cases.

Besides the procedural costs the secondary costs for these patients should be looked at. Often these patients are older and need additional care while suffering pain from their fractures.

- *There was limited Swiss-specific information to determine the secondary costs associated with PVP and PBK. To limit the assumptions made and the uncertainty of the model, additional care was limited to physiotherapy.*

Kommentar zu ethischen, sozialen und legalen aspekten

We strongly believe that patients with an acute or subacute non-consolidated fracture refractory to conservative treatment, Vertebroplasty and/or Kyphoplasty is/are effective in short term pain management and will significantly reduce the hospitalization length and bone consolidation allowing

patients to return to daily activities more rapidly. The VERTOS IV (1) trial showed positive effects on pain reduction in patients receiving either Vertebroplasty or Kyphoplasty when treated within eight weeks conversely to the VAPOUR trial (2), which did not show any benefit in patients treated, on average, after more than eight weeks. It should be mentioned that Australia healthcare authority will put vertebroplasty back on the reimbursement list after the VAPOUR trial.

- *Section 1 has been updated to reflect the change in reimbursement practice in Australia. "The procedure was relisted for reimbursement in 2020 for acute OVCFs."*

An increase load in patient hospitalizations and home care is expected in case of cessation of insurance reimbursement for Vertebroplasty or Kyphoplasty.

We do not have any comments regarding the legal aspects.

- *The anticipated increase in hospital and home care was highlighted in Section 12.4.4.*

Kommentar zu organisatorischen aspekten

Benign (osteoporotic) vertebral fracture management may be multidisciplinary but must be centred around a physician trained in the medical management for osteoporosis. In case of patient refusal, Vertebroplasty and Kyphoplasty must not be performed in the absence of medical management including standard of care for osteoporosis.

- *No amendment(s) required.*

Kommentar zu diskussion und schlussfolgerungen

The multitude of opinions, albeit divergent, concerning the role of Vertebroplasty and Kyphoplasty in the management of patients with benign vertebral fractures leads to unclear guidelines with weak or moderate levels of evidence. These treatments should be reserved for patients with proven non-consolidated vertebral fracture, presenting with pain that correlates to the vertebral fracture and who are currently receiving conservative pain management and treatment for osteoporosis.

We recently published our own recommendations regarding the use of vertebroplasty/kyphoplasty in osteoporotic vertebral fracture (1). We also share the same opinion detailed in the recommendations published by the American Society for Bone and Mineral Research in 2019 (2).

1. Vertebroplasty: the new CHUV consensus. Aubry-Rozier B, Ecker T, Saliou G, Lamy O. Rev Med Suisse. 2020 Mar 11;16(685):492-497.

2. The Efficacy and Safety of Vertebral Augmentation: A Second ASBMR Task Force Report. Ebeling PR, Akesso

- *The HTA has been updated to include the CHUV and the SVGO publications (see Section 3.4 and 13).*