Tabea Poos MSc / Dr. rer. medic. Melina Sophie Kurte / Ann-Cathrine Froitzheim MSc / Prof. Dr. med. Christoph Roderburg MHBA / Prof. Dr. med. Alexander Quaas / Dr. med. Dirk Waldschmidt / Prof. Dr. rer. medic. Florian Kron

Molecular testing in cholangiocarcinoma diagnostics

Findings from a systematic survey of outpatient reimbursement structures and a hospital survey

The remuneration and reimbursement of multiplex diagnostics (e.g. using next-generation sequencing; NGS) in the context of molecular diagnostics is proving to be heterogeneous in the German healthcare system depending on the treatment sector (Horgan et al., 2022). In the inpatient sector, it is possible to list the operation and procedure codes 1-996.0 and 1-996.1 for documentation purposes as part of regular remuneration via the DRG flat rates (diagnosis related groups) (Federal Institute for Drugs and Medical Devices, 2025). However, this does not trigger an extended monetary reimbursement amount in the DRG flat rate system (Kron et al., 2017). The framework conditions for outpatient reimbursement of NGS diagnostics, on the other hand, are regulated via a specific billing code in Chapter 19.4 of the Standardised Valuation Scale (EBM) (Institut des Bewertungsausschusses, 2016). For hospitals that can only rely on the inpatient reimbursement of DRG flat rates for NGS diagnostics, it is therefore not possible to bill the costs of NGS diagnostics via outpatient reimbursement (Kurte et al., 2023). Against this backdrop, the question arises as to whether an economic disincentive due to unbalanced reimbursement of diagnostic services between the inpatient and outpatient sectors could trigger a possible misuse and underuse of personalised medicine (Horgan et al., 2022; Kron et al., 2017; Kurte et al., 2023). An evaluation that systematically analyses which German hospitals can access outpatient reimbursement for molecular testing in CCA diagnostics does not yet exist. Accordingly, the aim of this analysis is to carry out a quantitative survey of the reimbursement structures of relevant hospitals, then to identify possible reimbursement gaps and finally to verify these results by means of a hospital survey.

Molecular testing in cholangiocarcinoma diagnostics – Findings from a systematic survey of outpatient reimbursement structures and a hospital survey

Background: Cholangiocarcinoma (CCA) are a heterogeneous group of malignant tumors with a poor prognosis. Next-generation sequencing (NGS) enables the identification of tumor-specific genetic alterations and serves as a basis for targeted therapies. A cost-covering reimbursement for NGS diagnostics has so far only been established in the outpatient care setting. This analysis aims to assess the current reimbursement structures for NGS diagnostics.

Methods: Considering the information asymmetry-based assumptions of the principal-agent theory, established outpatient reimbursement alternatives for the hospital sector were identified. Based on hospital quality reports, a database search was conducted to determine and analyze the available outpatient reimbursement options for each hospital that treated CCA cases in 2021. To validate the results, hospitals were surveyed via an online questionnaire.

Results: In 2021, a total of 9,023 CCA cases were treated as inpatients in 500 different hospitals. In 39.2% of the hospitals (n = 196), there was no possibility for outpatient reimbursement. These hospitals treated 27.2% of the cases (n = 2,451). Specialists from eight hospitals completed the online survey.

Conclusion: Hospitals without outpatient reimbursement options lack sufficient incentives to perform NGS diagnostics for CCA patients. This may lead to underuse and inadequate access to NGS-based therapies. To address this gap in care, appropriate reimbursement structures need to be established..

Keywords

Cholangiocarcinoma, CCA, molecular diagnostics, NGS diagnostics, targeted therapies, outpatient reimbursement, inpatient reimbursement

Background

Cholangiocarcinoma (CCA) is a rare, highly aggressive malignant neoplasm of the biliary tract that arises from the epithelial cells of the biliary system (Banales et al., 2020). It is divided into intrahepatic, perihilar and distal subtypes based on anatomical localisation (Bergquist & von Seth, 2015). Despite advances in diagnostics, the prognosis often remains unfavourable as the disease is often diagnosed at an advanced stage (Razumilava & Gores, 2014). The incidence varies depending on the region and ranges from 0.3 to 4.78 per 100,000 inhabitants in Europe (AMMF, 2023).

Treatment options for CCA depend on the progression of the disease (Razumilava & Gores, 2014). If the tumour is localised, resection can be considered (AWMF, 2024). Following a possible resection or as an alternative, tumour therapy can be carried out with medication (AWMF, 2024). In the first line of therapy, this consists of a combined chemotherapy regime (AWMF, 2024). The second line of therapy comprises either further chemotherapy or therapies with a targeted approach, provided that molecular alterations (biomarkers) are detected in the tumour tissue (AWMF, 2024). Testing for corresponding genetic alterations is carried out using molecular pathological diagnostics (hereinafter referred to as 'molecular diagnostics'). For CCA, for example, genetic markers associated with fusions of the fibroblast growth factor receptor (FGFR) 2 or mutations of the isocitrate dehydrogenase gene (IDH) 1 and 2, of the BRAF gene (v-Raf murine sarcoma viral oncogene homolog B1) as well as alteration of the neurotrophic tyrosine receptor kinase (NTRK) and overexpression of the human epidermal growth factor receptor (HER) 2 (Stenzinger et al., 2024). The detection of such molecularly altered properties is a prerequisite for the use of targeted therapies in the indication area of CCA (AWMF, 2024). Current studies indicate a positive impact on overall survival and quality of life through the use of targeted therapies in contrast to chemotherapy (Acher et al., 2021; Chong & Zhu, 2016; DiPeri et al., 2021; Kron et al., 2017). The S3 guideline for the diagnosis and treatment of hepatocellular carcinoma and biliary carcinoma recommends 'molecular characterisation of the tumour [...] at the latest by the time of the second-line treatment decision' (AWMF, 2024).

>> The basis of this care analysis is based on the principal-agent theory (Jensen & Meckling, 2019). In the context of the healthcare market, there is a treatment contract between doctors as agents and patients as headmasters (Schneider, 1998). Treatment decisions are made based on the agent's cost-benefit ratios, as they have an information advantage. This creates risks if the healthcare system is subject to (monetary) disincentives. In a profit-orientated system, this can lead to treatment decisions being influenced by economic incentives. If certain diagnostic methods are insufficiently reimbursed, their implementation can lead to monetary losses at the expense of the agents (Kron et al., 2021; Schneider, 1998).

Quantitative recording of reimbursement structures for molecular CCA diagnostics in Germany using secondary data

ZThe relevant outpatient billing modalities (via statutory health insurance) for molecular diagnostics were first identified in order to fully represent care and reimbursement structures from the hospital's perspective. The hospitals' current quality reports at the time the analysis was carried out (12/2023, base year: 2021) were then used to identify those hospitals that billed the ICD-10 diagnosis C22.1 (intrahepatic bile duct carcinoma) as the main diagnosis for inpatients. The databases of the German hospital directory and the ASV service centre (ASV service centre; hospital directory) were used to subsequently determine the available billing options per identified hospital. Based on the resulting database, hospitals were categorised into subgroups according to hospital size (up to 100 beds, up to 300 beds, up to 500 beds, up to 1,000 beds and more than 1,000 beds). Subsequently, a subgroup analysis was carried out with regard to the questions 'What is the proportion of hospitals with and without outpatient billing options (for performing molecular diagnostics) that treated CCA patients?' and 'What is the proportion of CCA cases treated in hospitals with and without outpatient billing options (for performing molecular diagnostics)?'.

Hospital survey to validate the results of the database search

In order to validate the results from the previously described database research on the remuneration and care structure in the status quo, all identified CCA-relevant hospitals were contacted using an online questionnaire. The questionnaire was designed according to the following key topics: Firstly, socio-demographically relevant topics of the hospitals were queried (including federal state, number of beds, level of care, certifications, case numbers, availability of outpatient billing options). This was followed by a general enquiry about diagnostic test procedures and the alterations tested in the context of a CCA disease. If NGS testing is carried out, a survey was conducted on the timing of the testing and the associated therapy, the handling of test billing and possible reasons for not carrying out NGS testing. If, on the other hand, NGS testing is not carried out, the reasons for this, the further procedure for affected patients and suggestions for improving the current remuneration situation were asked.

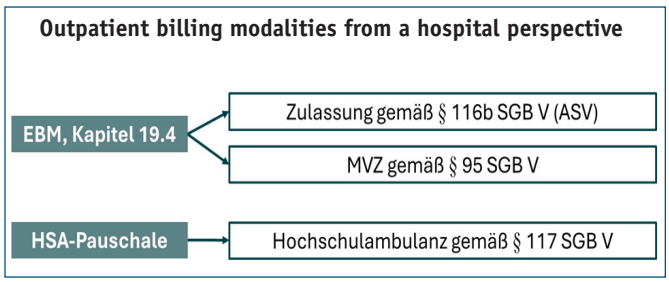


Fig. 1: Outpatient billing modalities that can be considered for billing molecular diagnostics from a hospital perspective. Abbreviations: ASV = outpatient specialist care, EBM = uniform evaluation scale, HSA = university outpatient clinic, MVZ = medical care centre, SGB V = Fifth Social Security Code. Own presentation.

The questionnaire was available to hospitals in the period from 06/2024 to 02/2025. An expense allowance of 50 euros was paid for answering the questionnaire.

The results

Evaluation of the reimbursement structures for molecular diagnostics in relation to CCA diagnostics - Evaluation of the secondary data analysis

Relevant billing modalities for CCA-related molecular diagnostics

Outpatient billing modalities that are available in the hospital sector for the reimbursement of CCA molecular diagnostics are shown in Figure 1.

Medical services provided by medical care centres (MVZ, according to § 95 SGB V) are remunerated according to the corresponding fee schedule items (GOP) of the standardised evaluation scale (EBM). This also includes referrals/orders for pathological examinations. Services within the scope of participation in outpatient specialised care (ASV, in accordance with Section 116b SGB V) are also remunerated via the EBM. Applicable EBM-GOPs are specified in the respective appendix of the ASV guideline (G-BA, 2013). CCA-related medical services can be assigned to ASV 'Gastrointestinal tumours and tumours of the abdominal cavity' (G-BA, 2013). Outpatient treatment in hospital (ABK, in accordance with Section 116b SGB V old version) is no longer used in the area of gastrointestinal tumours after a three-year transition phase to ASV (2014-2017) (G-BA, 2013). University outpatient clinics (HSA) also participate in outpatient care in accordance with Section 117 SGB V and are remunerated by means of flat rates per quarter per treatment case. The amount of the flat rates is determined individually by contracts with the health insurance funds/associations (GKV-SV & DKG, 2016).

CCA-relevant hospitals in 2021 and their available billing options

500 German hospitals that coded the CCA diagnosis C22.1 as the main inpatient diagnosis at least once in 2021 were identified via the hospitals' quality reports. A total of 9,023 cases were treated in these hospitals. The number of cases per hospital was between 4 and 183, with an average of around 18 cases per hospital. Figure 2 shows the aggregated availability of the individual billing

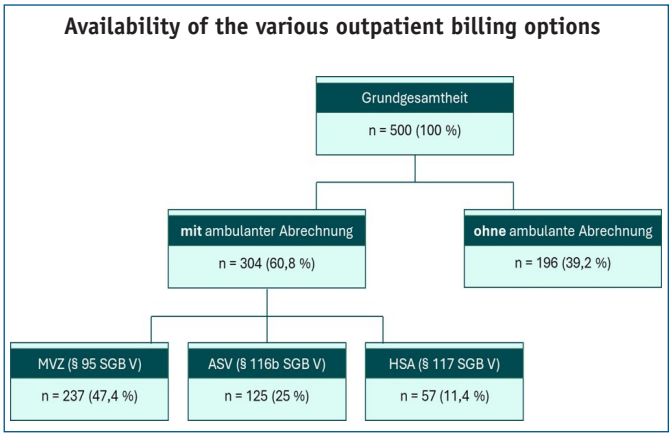


Fig. 2: Availability of the various outpatient billing options in the identified C22.1-relevant hospitals. Legend: * Percentages refer to the population of n = 500 hospitals. Abbreviations: ASV = Outpatient specialist care, HSA = University outpatient clinic, MVZ = Medical care centre, SGB V = Fifth German Social Code. Own representation.

Subgruppenaufteilung				
Subgruppe (Betten)	**Anzahl C22.1-relevanter KH**		**Anzahl stationärer C22.1.-Fälle**	
	absolut	**prozentual**	**absolut**	**prozentual**
>1000	45	9.00%	2.406	26.67%
501–1000	151	30.20%	3.184	35.29%
301–500	156	31.20%	2.183	24.19%
101–300	135	27.00%	1.125	12.47%
0–100	13	2.60%	125	1.39%
Summe	**500**	**100.00%**	**9.023**	**100.00%**

Tab. 1: Darstellung der Subgruppenaufteilung. Eigene Darstellung.

modalities in the identified hospitals. While 39.2% of the hospitals had no option for billing outpatient hospital services, 60.8% of the hospitals had at least one option for billing outpatient services. 47.4% of hospitals were affiliated to an MVZ, 25% participated in ASV for gastrointestinal tumours and 11.4% had an HSA.

Among the hospitals with billing options for outpatient services, 67.1% (204/304) had exactly one, 28% (85/304) had exactly two and 4.9% (15/304) had all three billing options.

Subgroup analysis

The distribution among the subgroups, measured by hospital size, is shown in Table 1. The C22.1-relevant hospitals were distributed according to hospital size, particularly between 100 and 1,000 beds. The proportion of hospitals under 100 and over 1,000 beds was less than 10% each (9% and 2.6%). The C22.1 case numbers, on the other hand, were mainly accounted for by hospitals with over 300 beds (approx. 86%). Hospitals with fewer than 300 beds treated approx. 14% of C22.1 cases.

The subsequent differentiation between C22.1-relevant hospitals with versus without outpatient billing options in the respective subgroups is shown in Figure 3. The majority of hospitals without the option to bill outpatient services were found in the two subgroups of hospitals with over 100 and up to 500 beds (101-300 beds: 78 hospitals, 301-500 beds: 70 hospitals). The relative proportion of hospitals without outpatient billing options increased as the number of beds per hospital decreased. This means that hospitals with a small number of beds were particularly affected by the lack of outpatient billing options.

The analysis based on the C22.1 case numbers is shown in Figure 4. CCA cases that were treated in hospitals without outpatient billing options were particularly distributed among hospitals with more than 100 and up to 1,000 beds (101-300 beds: 710 cases, 301-500 beds: 877 cases, 501-1,000 beds: 720 cases). In total, 27.2% of CCA cases in 2021 were treated in hospitals without outpatient billing options (2,451 cases). As the number of beds per hospital decreased, there was a proportionate increase in cases in hospitals without outpatient billing: 1.8% in hospitals with more than 1,000 beds and 80% in hospitals with up to 100 beds.

Results of the hospital survey to validate the secondary data analysis

Results of the online survey

The online survey on the remuneration of molecular diagnostics was answered by 8 medical specialists from 6 of the 16 federal states. Baseline characteristics are shown in Table 2. Overall, the picture is largely balanced in terms of the respective hospital care levels, existing certifications and case numbers. 50% of the hospitals do not have outpatient billing options.

The survey results of the participating hospitals that perform NGS tests are shown in detail in Table 3. NGS diagnostics are carried out in 25% (2/8) of the responding hospitals. In each case, the in-house pathology department is responsible (100%). Testing takes place after the inpatient stay (100%). 50% of the hospitals also carry out tests during the inpatient stay. Billing takes place exclusively via ASV (100%). Treatment begins either immediately after the NGS test result is available (50%) or alternatively before the NGS test result is available and is then adjusted according to the test result if necessary (50%) after the test result is available, as indicated in the free text field of the corresponding question. The duration between NGS test performance and presentation of the result is stated as 10 or 25 days.

The responding specialists see potential reasons for not carrying out NGS tests in particular in the limited possibilities of cost-covering billing for NGS diagnostics (100%) and in the lack of infrastructure (100%). There may also be medical reasons for not testing (50%).

Table 4 shows the survey results of the participating hospitals that do not perform NGS tests. This is the case for 75% (6/8) of the responding hospitals. The reasons for this are the lack of cost-covering billing options (50%), lack of infrastructure (16.67%) or the use of alternative test procedures (16.67%). Patients who do not receive NGS diagnostics in the respective hospitals are either referred to private practice (50%), receive treatment without diagnostics (33.33%) or receive diagnostics using other test procedures (16.67%). In order to improve the remuneration situation, the responding specialists see in particular the establishment of cost-covering testing in selected centres (66.67%), an expansion of ASV (66.67%) and an adjustment/increase in DRG flat rates

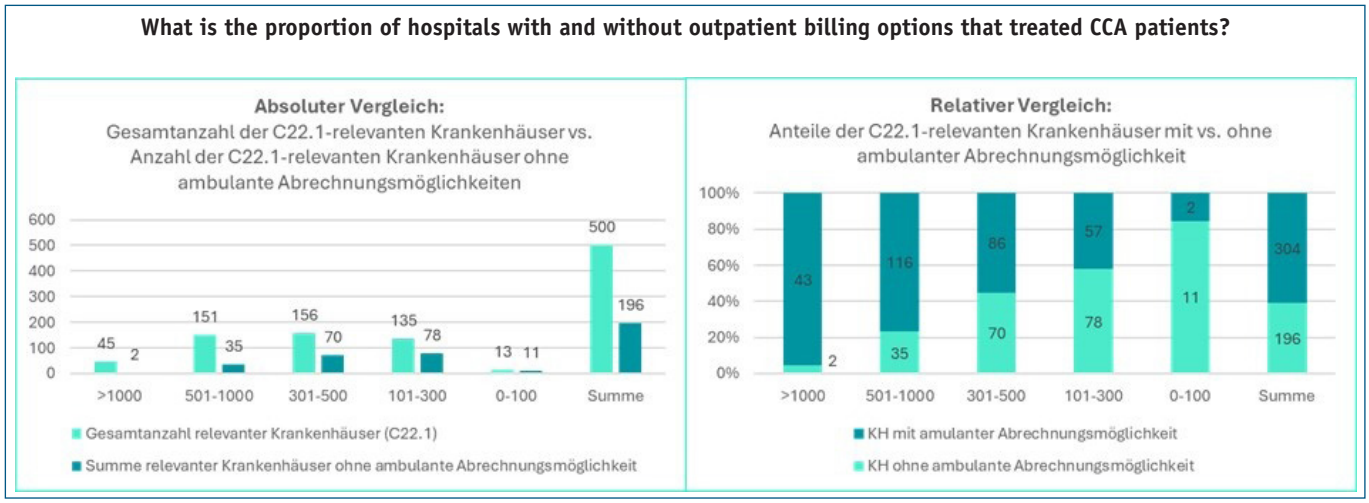


Fig. 3: What is the proportion of hospitals (for performing molecular diagnostics) with and without outpatient billing options? Abbreviations: KH = hospital. Own representation

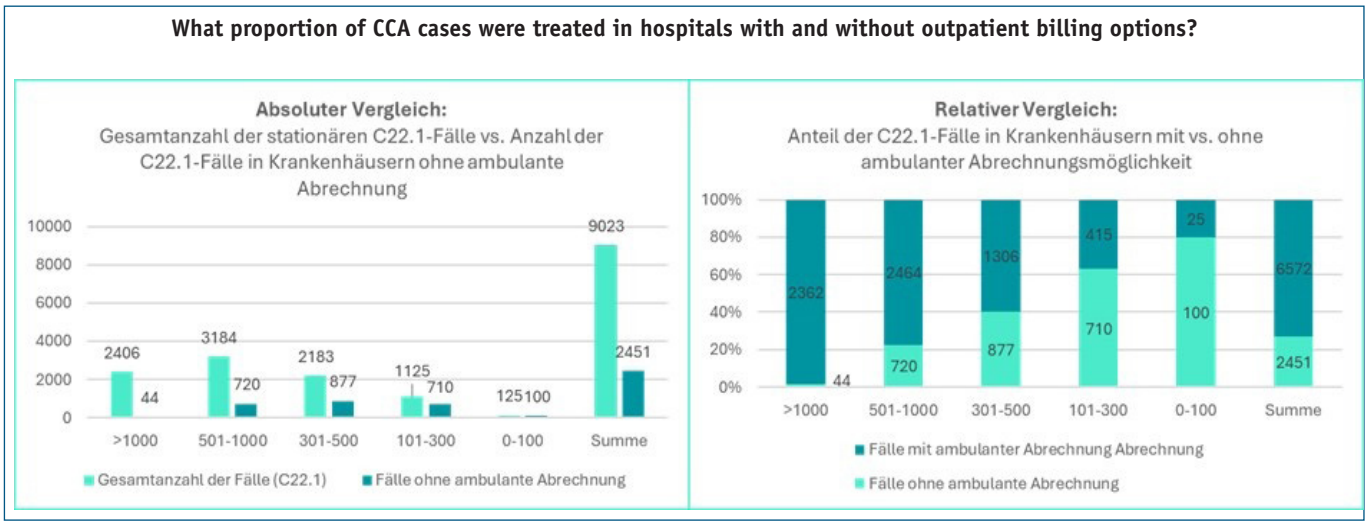


Fig. 4: Fig. 4: What proportion of CCA cases were treated in hospitals with and without outpatient billing options (for molecular diagnostics)? Own illustration.

(66.67%). In addition, contracts in accordance with Section 140a SGB V (16.67%) and the establishment of NUB/ZE for NGS testing (16.67%) were selected.

Discussion

Guideline-compliant treatment of CCA requires molecular tumour characterisation from the second line of treatment onwards, which is an essential basis for treatment decisions (AWMF, 2024). This analysis shows the care and reimbursement situation for NGS tests in CCA diagnostics. As inpatient reimbursement is not considered cost-covering, adequate reimbursement is only possible via outpatient billing modalities (Kurte et al., 2023). The database search shows that around 40% of hospitals without the option of outpatient billing for NGS diagnostics have to resort to inpatient reimbursement structures for reimbursement. According to the principal-agent theory, there is no sufficient economic incentive for these hospitals to carry out molecular diagnostics. Consequently, for more than 25% of CCA cases, there is a risk of underuse and/or misuse due to a lack of molecular diagnostics. Unlike in the indication area of non-small cell lung cancer (NSCLC) via the prospective 'CRISP' registry study of the Arbeitsgemeinschaft Internistische Onkologie (Griesinger et al., 2021), studies that do not provide evidence of comprehensive biomarker testing rates in CCA diagnostics are not available.

In this context, the online survey to verify the database research with a relatively low response rate can only provide an indication of the real care situation for NGS diagnostics in CCA patients. Although socio-demographic characteristics are largely homogeneously mapped, sufficient representativeness is not guaranteed with eight survey responses. Nevertheless, NGS diagnostics are not performed in 6 out of 8 cases (75%). The most frequently cited reason is the inability to cover costs. Even though half of these hospitals arrange for a referral to a private practice, two hospitals state that they will continue with treatment without diagnostics. In conclusion, this result means that a lack of a cost-covering remuneration structure leads, at least in individual cases, to the quality of care for CCA patients not meeting the requirements of the guideline and

confirms the hypothesis of underuse and misuse. There is therefore a need for regulatory action to ensure a needs-based remuneration and reimbursement situation for guideline-compliant diagnosis by NGS testing in the inpatient care setting by adjusting the DRG flat rates per case. Alternatively, there is also a high level of approval (67%) among the survey participants for the establishment of cost-covering tests in selected centres.

If NGS tests are carried out, ASV is the preferred reimbursement modality according to the survey. However, this requires the diagnostics to be transferred from the inpatient care setting to the hospital's outpatient care structures. In addition, the hospital must participate in ASV, which requires the formation of an interdisciplinary team from different specialities in accordance with the ASV guideline (G-BA, 2013). In reality, however, this can only be realised in the medium term for clinics without previous participation. In the short term, local cooperation between clinics or centre links should be established and promoted in order to manage patient flows between clinics with and without outpatient billing options.

One long-term option for ensuring more comprehensive provision of NGS diagnostics is the agreement of selective contracts for special care in accordance with Section 140a SGB V for selected and specialised centres. An existing example of this is the National Network Genomic Medicine Lung Cancer (nNGM). The nNGM is a nationwide network that aims to give patients with advanced lung cancer access to quality-assured NGS diagnostics (nNGM, 2025). It is also essential not only that there is basic care for all affected patients and a corresponding reimbursement option for NGS diagnostics, but also that quality standards are adhered to, that adequate Counselling regarding the test results and achieving the shortest possible test duration (Horgan et al., 2022). In the survey, the time between carrying out the test and receiving the test result was already between 10 and 25 days.

In addition to the low response rate of the hospital survey and the resulting reduced representativeness, the analysis is subject to further limitations. As the database research is based on data from 2021, subsequent developments are not taken into account. Against the background of the hospital reform and the associated promotion of greater outpatientisation of medical services, it may be useful to update the analysis to take current developments into account.

Baseline characteristics of the survey participants

Merkmal	Anzahl	Anteil
Teilnehmende Fachärzt:innen insgesamt	8	100.00%
Bundesland		
Baden-Württemberg	1	12.50%
Mecklenburg-Vorpommern	1	12.50%
Niedersachsen	1	12.50%
Nordrhein-Westfalen	2	25.00%
Sachsen	1	12.50%
Thüringen	2	25.00%
Bettenanzahl des Krankenhauses		
0-100 Betten	2	25.00%
101-300 Betten	0	0.00%
301-500 Betten	2	25.00%
501-1000 Betten	1	12.50%
>1000 Betten	3	37.50%
Kategorie/Versorgungsstufe des Krankenhauses		
Hochschulklinik	2	25.00%
Maximalversorgung	1	12.50%
Schwerpunktversorgung	2	25.00%
Regel-/Grundversorgung	3	37.50%
Zertifizierungen/Zertifikate*		
Keine der im Folgenden genannten	1	12.50%
Organkrebszentrum (C) nach DKG im Bereich GIT	5	62.50%
Onkologisches Zentrum (CC) nach DKG im Bereich GIT	3	37.50%
Förderung als Onkologisches Spitzenzentrum (CCC) nach DKG im Bereich GIT	1	12.50%
DGHO	2	25.00%
Stationäre Fallzahlen (2021)		
Keine Fälle	0	0.00%
1 – 29 Fälle	3	37.50%
30 – 49 Fälle	2	25.00%
50 – 99 Fälle	2	25.00%
100 – 150 Fälle	0	0.00%
> 150 Fälle	1	12.50%
Ambulante Fallzahlen (2021)		
Keine Fälle	0	0.00%
1 – 29 Fälle	5	62.50%
30 – 49 Fälle	1	12.50%
50 – 99 Fälle	1	12.50%
100 – 150 Fälle	0	0.00%
> 150 Fälle	1	12.50%
Verfügbarkeit ambulanter Abrechnungsmöglichkeiten*		
Keine der im Folgenden genannten	4	50.00%
Hochschulambulanz (§ 117 SGB V)	1	12.50%
ASV (§ 116b SGB V): Gastrointestinale Tumoren und Tumoren der Bauchhöhle	3	37.50%
MVZ (§ 95 SGB V) in Trägerschaft Krankenhaus	2	25.00%
Diagnostische Testverfahren zur CCA-Diagnostik*		
DNA (über NGS)	6	75.00%
RNA (über NGS)	3	37.50%
FISH	3	37.50%
IHC	5	62.50%
Testung genetischer Alterationen im Rahmen der CCA-Diagnostik*		
IDH1 Mutationen	7	87.50%
FGFR2 Fusionen	7	87.50%
NTRK Fusionen	8	100.00%
ERBB2 / HER Überexpression	4	50.00%
BRAF V600 Mutationen	6	75.00%
dMMR /MSI-H Status	6	75.00%
Zeitpunkt der Testung eines CCA-Patienten*		
Vor der Erstlinientherapie	2	25.00%
Während der Erstlinientherapie	5	62.50%
bei Progress/refraktär	5	62.50%
Durchführung von NGS im Rahmen der CCA-Diagnostik		
Ja	2	25.00%
Nein	6	75.00%

Tab. 2: Baseline characteristics of the survey participants. Legend: * Multiple answers possible. Abbreviations: ASV = outpatient specialist care, BRAF = B-Raf protooncogene, serine/threonine kinase, CCA = cholangiocarcinoma, DKG = German Cancer Society, DGHO = German Society for Haematology and Medical Oncology, dMMR = deficient mismatch repair, DNA = deoxyribonucleic acid, ERBB2 = Erb-B2 receptor tyrosine kinase 2 (also HER2), FGFR2 = fibroblast growth factor receptor 2, FISH = fluorescence in situ hybridisation, GIT = gastrointestinal tract, HER = human epidermal growth factor receptor, IHC = immunohistochemistry, IDH1 = isocitrate dehydrogenase 1, MSI-H = Microsatellite instability high, MVZ = Medical care centre, NGS = Next-generation sequencing, NTRK = Neurotrophic tyrosine receptor kinase, RNA = Ribonucleic acid, SGB V = Fifth Social Code. Own presentation.

Conclusion

Overall, the reimbursement of NGS diagnostics requires a structural revision to ensure that there are no economic disincentives to the early analysis of genetic alterations in accordance with the guideline recommendation. Entity- and stage-specific scientific analyses, e.g. in relation to real test rates, are necessary for a reliable data situation and final assessment of the overall situation. Local co-operation between clinics offers short-term scope for improving the care situation. In the medium term, participation in ASV is an alternative that can counteract a deficit in outpatient reimbursement alternatives. Selective contracts in accordance with Section 140a SGB V can be a long-term solution for the comprehensive and quality-assured provision of NGS diagnostics. <<

Survey results, if NGS testing is performed

Merkmal	Anzahl	Anteil
Durchführung der Testung durch interne vs. externe Pathologie		
Durch hausinterne Pathologie	2	100.00%
Durch auswärtige / externe Pathologie	0	0.00%
Testung im abulanten oder stationären Setting*		
Während des stationären Aufenthalts	1	50.00%
Nach dem stationären Aufenthalt (ambulant)	2	100.00%
Abrechnung der NGS-Testung*		
ASV (§ 116b SGB V)	2	100.00%
MVZ (§ 95 SGB V)	0	0.00%
Hochschulambulanz (§ 117 SGB V)	0	0.00%
DRG: mit ILV (innerbetriebliche Leistungsverrechnung) zwischen Pathologie und Klinik	0	0.00%
DRG: ohne ILV (innerbetriebliche Leistungsverrechnung) zwischen Pathologie und Klinik	0	0.00%
Konsiliarisch über externe Pathologie (Rechnungsstellung z. B. über GOÄ)	0	0.00%
Selektivvertrag nach § 140a SGB V (Besondere Versorgung)	0	0.00%
Persönliche Ermächtigung (§ 116 SGB V)	0	0.00%
Institutsermächtigung (§ 116a SGB V)	0	0.00%
Regionale Besonderheiten	0	0.00%
Keine eigene Abrechnung, aber Kooperation mit niedergelassener Pathologie	0	0.00%
Keine eigene Abrechnung, aber Kooperation mit anderem Krankenhaus	0	0.00%
Anteil der CCA-Patient:innen, die NGS-Diagnostik erhalten (%)		
1. 90 %		
2. 100 %		
Dauer zwischen NGS-Testdurchführung und Vorlage des Ergebnisses (in Tagen)		
1. 10 Tage		
2. 25 Tage		
Dauer zwischen Vorliegen des NGS-Testergebnisses und Therapiebeginn		
Unmittelbar nach Vorliegen der Testergebnisse (<1 Tag)	1	50.00%
1-2 Tage	0	0.00%
> 2 Tage	0	0.00%
Therapiebeginn vor Vorliegen der Testergebnisse	1	50.00%
Gründe für eine potenzielle Nichtdurchführung einer NGS-Testung*		
Keine Gründe	0	0.00%
keine Möglichkeit der Abrechnung, nicht kostendeckend	2	100.00%
keine Infrastruktur	2	100.00%
alternative Testverfahren	0	0.00%
Testung aufgrund Anamnese / medizinischer Gründe nicht notwendig	1	50.00%
Dauer bis zum Vorliegen des Testergebnisses zu lange	0	0.00%

Tab. 3: Survey results, if NGS testing is performed. Legend: * Multiple answers possible. Abbreviations: ASV = outpatient specialist medical care, CCA = cholangiocarcinoma, DRG = diagnosis related groups, GOÄ = scale of fees for physicians, ILV = internal cost allocation MVZ = medical care centre, NGS = next-generation sequencing, SGB V = Fifth Social Security Code. Own presentation.

Survey results if no NGS testing is performed

Merkmal	Anzahl	Anteil
Gründe für die Nicht-Durchführung von NGS-Testungen*		
keine Möglichkeit der Abrechnung, nicht kostendeckend	3	50.00%
keine Infrastruktur	1	16.67%
alternative Testverfahren	1	16.67%
Testung aufgrund Anamnese / medizinischer Gründe nicht notwendig	0	0.00%
Dauer bis zum Vorliegen des Testergebnisses zu lange	0	0.00%
Sonstige Gründe	1	16.67%
Verfahren mit Patient:innen, die keine NGS-Testung erhalten		
Therapie ohne Diagnostik	2	33.33%
Diagnostik durch andere Testverfahren	1	16.67%
Überweisung in anderes Krankenhaus	0	0.00%
Überweisung in den niedergelassenen Bereich	3	50.00%
Mögliche Verbesserungen der aktuellen Vergütungssituation von NGS-Testung*		
Keine bestehenden Vergütungsprobleme	0	0.00%
kostendeckende Testung in ausgewählten Zentren etablieren	4	66.67%
Verträge nach § 140a SGB V	1	16.67%
Ausweitung der ASV (§ 116b SGB V)	4	66.67%
Etablierung von NUB / ZE	1	16.67%
Anpassung / Erhöhung der DRG-Fallpauschalen	4	66.67%

Tab. 4: Survey results if no NGS testing is performed. Abbreviations: ASV = outpatient specialised care, NUB = new treatment and examination methods, DRG = diagnosis related groups, NGS = next-generation sequencing, SGB V = Fifth Social Code, ZE = additional fees. Own presentation.

Authors' statement

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Christoph Roderburg works at the University Hospital Düsseldorf, Alexander Quaas and Dirk Waldschmidt at the University Hospital Cologne.

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