Final Report

G-DRG System Update for the Year 2006

Classifications, Catalogue and Cost Weights

Part I: Project Report

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Abbreviations

2. FPÄndG	*Zweites Fallpauschalen-Änderungsgesetz* (Second Case-based Fixed-sum Amendment Law)
AA	Arithmetical Average
AICD	Automatic Implantable Cardioverter Defibrillator
av.	Average
BMGS	*Bundesministerium für Gesundheit und Soziale Sicherung* (Federal Ministry for Health and Social Security)
BPflV	*Bundespflegesatzverordnung* (Federal Ordinance for Care Remuneration)
CC	Complication or Comorbidity;
CCL	Complication or Comorbidity Level
CCT	Craniocerebral Trauma
Ch.	Chapter
CI	Confidence Interval
CW	Cost Weight
DIMDI	*Deutsches Institut für Medizinische Dokumentation und Information* (German Institute for Medical Documentation and Information)
DKG	*Deutsche Krankenhausgesellschaft* (German Hospital Federation)
DKR	*Deutsche Kodierrichtlinien* (German Encoding Guidelines)
DRG	Diagnosis Related Group
ECCE	Extra Capsular Cataract Extraction
etc.	et cetera
FPV 2005	*Vereinbarung zum Fallpauschalensystem für Krankenhäuser für das Jahr 2005 (Fallpauschalenvereinbarung 2005*) (2005 Case-based Fixed-sum Agreement for Hospitals)
FPV 2006	*Vereinbarung zum Fallpauschalensystem für Krankenhäuser für das Jahr 2006 (Fallpauschalenvereinbarung 2006*) (2006 Case-based Fixed-sum Agreement for Hospitals)
G-DRG	German Diagnosis Related Groups
GM	German Modification (ICD-10-GM)
HC	Homogeneity coefficient (of cost)
HC_{LOS}	Homogeneity coefficient of Length of Stay
i.a.	amongst others
ICD	International Statistical Classification of Diseases and related Health Problems, 10th Revision, Version for the German Social Security Code for Health Insurance (SGB V)
i.e.	that is

InEK	*Institut für das Entgeltsystem im Krankenhaus gGmbH* (Institute for the Hospital Remuneration System gGmbH
KEA	*Krankenhaus-Entgelt-Ausschuss* (Hospital Remuneration Commission)
KHEntgG	*Krankenhausentgeltgesetz* (Hospital Remuneration Law)
KHG	*Krankenhausfinanzierungsgesetz* (Hospital Funding Law)
LOS	Mean Length of Stay
m.	Million
MDC	Major Diagnostic Category
Med.	medical
MS	Multiple Sclerosis
n	Number of cases
no.	Number
NUB	New examination and treatment methods
OGV	Upper length of stay margin
OPS	*Operationenschlüssel nach § 301 SGB* V (Classification of Medical procedures based on para. 301 German Social Code – German version of the ICPM)
OR	Operating Room
Para.	Paragraph
PCCL	Patient Clinical Complexity Level
Pre-MDC	main diagnose group preceding the MDCs
PTCA	Percutaneous Transluminal Coronary Angioplasty
Qu.	Quantile
R^2	Variance Reduction
SD	Standard Deviation
SD_{LOS}	Standard Deviation of Length of Stay
SDS	Specialist Department Segment
TAB	Table
UGV	Lower Length of Stay Margin

Foreword

With this report, the *Institut für das Entgeltsystem im Krankenhaus gGmbH (InEK)* provides further details concerning the procedure involved in the process of calculation, as well as the cost and service profiles of the individual DRG case-based fixed sums. It can form the basis of detailed analyses of particular issues and individual specialist areas of medicine for hospitals, health insurance companies and other interested parties.

The previously chosen path of continually improving the consideration of distinctive aspects of The Federal Republic of Germany's medical care structures and methods of treatment in the case-based fixed-sum catalogue has also been consequently followed this year. The reflective accuracy of the 2006 cased-based fixed sum catalogue, as measured by the statistical factor of homogeneity, has once again been significantly improved.

This year, 214 hospitals have voluntarily provided case-based cost data within the framework of random calculation checks to aid further development. Here we would like to thank all hospitals that have participated in these checks for the great commitment they have shown. An additional important component in further development has been supplied by the specialist organisations, associations, experts and individuals from the hospitals that have constructively participated in the recommendation procedure for improving DRG classification ("structured dialogue").

It is our wish that hospitals continue to participate constructively in the further development and calculation of the DRG case-based fixed sum system, especially those hospitals that treat particular groups of patients thereby providing evidence of where necessary changes should be made. We also call upon specialist medical organisations to continue to participate constructively in the recommendation procedure, thus providing proficient impulses for the further development of the system.

1 Introduction

The final report at hand describes basic principles, procedures and results of the improved G-DRG system for 2006. The report is aimed at an interested specialist public and contributes to making the procedure on which the further development is based more transparent and fostering an understanding of the interrelationships within the G-DRG system.

The general regulative framework provided by the Hospital Remuneration Law (KHEntgG) envisages an intermediary period of implementation, beginning in 2005, to enable those concerned to plan a scheduled and structured transition (the so-called convergence phase). The individual hospital base rates are to gradually converge to a uniform base rate at state level during this convergence phase. To cushion the effects of steps towards convergence, the Second Case-based Fixed-sum Amendment Law (2. FPÄndG) has introduced an upper limit for the equalisation of the revenue budget (capping limit) according to which the budget reduction of a hospital may not exceed a specific limit. The capping limit rises steadily between 2005 and 2009 from 1.0% to 3.0%. A further important component in a scheduled and structured transition is the annual improvement of the reflective accuracy of the G-DRG system.

The “Recommendation Procedure for Integrating Medical, Scientific and Other Expert Knowledge in the G-DRG System Update for 2006 (Recommendation Procedure 2006)” assisted the job of maintaining the G-DRG system. Specialist medical organisations, hospital and health insurance associations as well as other institutions have submitted recommendations for the further development of the system within the framework of this process, also known as “structured dialogue”. Experience in clinical practice and expert medical knowledge have flowed into the system development as a result of comprehensive participation in the Recommendation Procedure 2006. In this, the G-DRG system has proved itself to be a “learning system” in the best of senses.

The development and maintenance of the G-DRG system carried out by InEK would not have been possible without the voluntary participation of hospitals in random calculation checks. Development of the G-DRG system relies fundamentally on the data of a complete calendar year - the G-DRG system 2006, for example, relies on the data of 2004. It is therefore practically predestined that innovations can only be integrated into the G-DRG system with a time delay. However, thanks to the commitment of the calculation hospitals in providing information on costs and services beyond that absolutely necessary for participation in the calculation process, a faster development of the system has been possible. Consequently, numerous innovations such as, for example, the TISS/SAPS Intensive score newly introduced into the 2005 OPS could be incorporated in the G-DRG system practically without delay.

Payment of a fixed sum reimbursement to the hospitals participating in the cost calculation is anchored in the 2. FPÄndG legislation. In addition to a basic reimbursement, the hospitals should be paid a case-related reimbursement depending on the amount and quality of the data records delivered. To do so, a calculation supplementary charge of 0.59 € was raised within the framework of the 2005 DRG system supplementary charges. In this year’s calculation round the InEK paid, for the first time, a fixed sum reimbursement to the hospitals participating in the cost calculation with a total volume of 8.9m €.

In December 2004, the central health insurance fund associations, the private health insurance association and the German hospital federation (self-governing partner) issued a joint resolution on basic principles in the development of the remuneration system. In this, InEK was commissioned to appropriately continue developing and maintaining the G-DRG System on the basis of previous calculation experience. A particular effort should be made to reflect day-patient care in the DRG case-based fixed-sum catalogue.

To realise this resolution InEK presented the self-governing partners with the draft of a G-DRG system for 2006 on 18th August 2005. On 13th September 2005, at the end of their deliberations, the self-governing partners concluded the "Agreement concerning the Case-based Fixed-sum System for Hospitals for the Year 2006 (Case-based Fixed-sum Agreement 2006 – FPV 2006)". This agreement encompasses the following components of the G-DRG remuneration system for 2006:

- the invoicing conditions,
- the case-based fixed sum catalogue,
- the supplementary remuneration catalogue,
- the catalogue of medical services not reimbursed in the case-based fixed sum catalogue, and
- the catalogue of supplementary remuneration in accordance with para. 6 section 1 of the KHEntgG.

This final report consists of two parts. Part I (Project Report) presents the methodology and the most important results. In this, the project report forgoes a detailed description of methods of calculation that have remained unchanged over the years. Interested readers are referred to previous project reports that are available for downloading on our internet site. Part II (Clinical Profiles, Cost Profiles) contains the detailed calculation results prepared in table format. The cost profiles are exclusively available in browser form for perusal and downloading on our internet site (www.g-drg.de).

On behalf of the InEK gGmbH colleagues,

Dr. Frank Heimig Manager	Dr. Martin Braun Head of the Medical Department	Dr. Michael Schmidt Head of the Business Department

Siegburg, December 2005

2 Methodology of the Update

This chapter provides a summary of the methodological steps stipulated by the body of rules for the maintenance and development of the G-DRG system. A detailed description of the procedure can be found in the G-DRG system project reports for the years 2004 and 2005. These are available for downloading on the homepage (www.g-drg.de). The methodological adjustments required by the 2006 update are described individually in ch. 3.3.1.

2.1 Data Collation and Verification

Data Collation

Provision of the data necessary for the development of the G-DRG system is regulated by para. 21 KHEntgG of 23rd April 2002. This stipulates that all hospitals are obliged to provide hospital specific structure data and case related service data annually in a complete collation of data (hereafter known as “DRG data as per para. 21 KHEntgG”). Appendix 2 to the agreement according to para. 21 KHEntgG – last updated by the self-governing partners on 17th December 2004 – defines the content and format of the data sets to be supplied (hereafter known as “DRG data sets as per para. 21 KHEntgG“). The DRG data as per para. 21 KHEntgG is to be communicated on the 31st of March for the respective previous calendar year to a DRG data centre, on a federal level, appointed by the self-governing partners. The InEK is entrusted with the control and supervision of the DRG data centre.

In addition, cost data is provided by hospitals that participate voluntarily in a partial census. These hospitals will hereafter be designated “calculation hospitals”. The InEK concludes an “Agreement on the Participation in the Calculation for Maintaining and Developing the G-DRG System” with the calculation hospitals. The data sets provided by the calculation hospitals consist of the DRG data as per para. 21 KHEntgG augmented by case-based cost data. The data is also supplied to the DRG data centre via the procedure described for the communication of the DRG data as per para. 21 KHEntgG. The calculation hospitals received for the first time, under specific preconditions, fixed sum remunerations for providing the cost data for 2004, depending on the quality and extent of the data supplied.

In the agreement concluded with the InEK the calculation hospitals commit themselves to applying the methodology set out in the calculation handbook of the self-governing partners (“Calculating Case Costs – A Handbook for Use in Hospitals – Version 2.0“) when calculating case costs. The published “Actualisations and Addenda to the Calculation Handbook Version 2.0” of 17th December 2004 is also to be observed. The calculation hospitals are queried about their individual costs classification and the possibility of an additional differentiated provision of data by means of check lists.

Besides the “normal” data provision as per para. 21 KHEntgG and the communication of cost data, the InEK also requests the provision of additional case information from the calculation hospitals. This refers to

- Service information not sufficiently differentiated by the OPS codes,

- Cost information that cannot be identified on a service basis in the modular cost representation, and
- Procedural information intended to provides information about the calculation procedure applied and to ensure adequate data quality.

Comprehensive data protection measures, the organisational and technical aspects of which are regularly scrutinised by an independent external data protection officer, have been established to protect the data collated.

Data Verification

The data supplied by the hospitals is subjected to technical and content verification.

The technical verification ("error processing procedure") is carried out by the DRG data centre within the framework of data receipt. A three-stage procedure is applied in accordance with InEK specifications:

- stage 1 – preliminary test: checking the processability
- stage 2 – format test: checking the data structure
- stage 3 – data test: checking the field content

The hospitals receive a protocol of the test results.

A complete description of the DRG data centre's error processing procedure can be accessed on the InEK homepage (www.g-drg.de).

The verification of the data content is carried out by InEK. Following technical verification, error-free data sets free run through a verification programme on three levels:

- economic verification is applied to cost data supplied by the calculation hospitals. The costs are checked for the presence or absence of values, the admissibility of values and infringement of fixed parameter criteria on various levels of analysis (e.g. hospital, cost centre group, treatment case).
- medical verification is applied to medical case information, in particular the encoded diagnoses and procedures. These are checked for conformity with the German Encoding Guidelines (DKR) and the regulations contained in the ICD and OPS catalogues, concentrating on grouping relevant characteristics.
- medical-economic verification checks the coherency between medical and economic case data. Within the scope of field spanning verification interdependent relationships are examined that effect, for example, the presentation of cost data in the case of specific diagnosis or procedure combinations.

The calculation hospitals receive a detailed report of the verification results and are requested to provide corrected data where possible.

Error-free data sets are fed into the database that forms the basis of the G-DRG system update.

2.2 Data Processing

In the course of data processing, the data sets shown to be error-free by the verification process are subjected to various adjustments and corrections to counteract the distorting effects of inhomogeneous conditions among the hospitals and to create a uniform time-scale point of reference. This includes:

- Case consolidation: the FPV accounting rules envisage under certain circumstances the consolidation of multiple stays in one and the same hospital by patients into one joint period of hospitalisation (para. 2 FPV for re-admissions and para. 3, section 3 FPV for patient transfers). The data sets are analysed for FPV conditions and the requisite information consolidated into one case.

  Basically, all non-redundant information about the treatment case to be consolidated is carried over. Since no simple rule on determining the principle diagnosis is possible, the principle diagnosis of the first case that falls under the consolidation rules is taken as the principle diagnosis for the consolidated treatment case.

- Adjustment for non-relevance to DRG: the DRG system does not apply to services provided by establishments cited in para. 1 section 2 of the Psychiatry Personnel Ordinance and by establishments for psychosomatic and psychotherapeutic medicine, as far as nothing to the contrary is determined in the ordinance according to para. 16 clause 1 no.1. Such cases have no relevance for the DRG and are transferred to a separate data pool.

- Adjustment for transferrals: case group definition and the calculation of LOS values and cost weight of the case-based fixed sum catalogue are based on non-transferral cases. Transfer cases are, as a rule, not considered in development of the system. An exception is made for case groups where the transfer disagio is suspended (marker in column “Case-based Transferral Fixed-sum” of the case based fixed sum catalogue).

  Those case groups the cost weights of which are calculated including transferral cases in the G-DRG system, version 2006, are listed in table A-1 in the appendix.

- Adjustment for “overlier”: “overlier” are treatment cases admitted the preceding year but discharged in the year being evaluated. Only overlier cases where the calculation hospital explicitly declares that the proportion of cost applying to the previous year is fully contained in the data set are considered in system development.

- Source correction: various wage agreements lead to lower personnel costs in hospitals in the new German states than in hospitals situated in the old federal states. Therefore the data sets supplied by hospitals in the new states are adjusted in the area of personnel costs (cost type groups 1-3) to match the valid wage agreements of the older states by means of a correction factor.

- Correction for supplementary remuneration: certain services are liable to supplementary remuneration which can be billed in addition to the case-based fixed-sums. All case data sets with such services are corrected by the appropriate cost proportion.

The G-DRG system records both inpatient and day-patient services. Service provision in full inpatient care is additionally divided into main departments and referral departments. To determine the specific LOS values and cost weights the adjusted and

corrected case totality is summarised in the respective groups according to the criteria “department type” and “form of service”.

2.3 Classification Derivation

Calculation of Length of Stay Values

Case-based fixed-sum remuneration relates to treatment carried out within the framework of a standard length of stay.

Cases treated within the framework of the standard length of stay are termed “normal liers” or “inliers”. The parameters of the standard length of stay are set by the Lower Length of Stay Margin (UGV) and the Upper Length of Stay Margin (OGV). The extensiveness of the inlier database relevant for system development is defined by determining the Lower and Upper Length of Stay Margins.

The UGV is calculated as being a third of the arithmetical average length of stay, with a minimum, however, of two days. No UGV is calculated for DRGs with explicit one-day occupancy.

The OGV is calculated as the sum of the mean length of stay and twice the standard deviation, unless twice the standard deviation exceeds a fixed predetermined maximum difference. In such a case, the OGV is calculated as the sum of the mean length of stay and the maximum difference. The fixed maximum difference is so chosen that day-based revenue supplements for day-outliers beyond the OGV are accounted for by a predetermined volume of remuneration on a case-based fixed-sum basis.

No OGV is calculated for DRGs with explicit one-day occupancy.

Case Cost Calculation

For every DRG of the existing G-DRG system (initial version) the cases of all calculation hospitals are combined into one file as if they originated from one single hospital (the so-called “one house method”).

The arithmetical average inlier case cost calculated from this source forms the central basis for classification derivation.

Calculation and Evaluation of Changes in Classification

Information received within the framework of the recommendation procedure and the results of InEK’s own variance analyses form the starting point of G-DRG classification development.

The proposals may give rise to various alternatives for change. The available alternatives are put through a simulation and the results evaluated particularly in regard to the degree of variance reduction (R^2) achieved. R^2 measures the proportion of cost spread that can be accounted for through classification. The smaller the proportion of accounted for spread within a category in comparison to the spread between categories, the greater the overall quality of the classification system.

An additional analysis deals with change in individual case group cost homogeneity by which the effects of a classification change on the composition of a newly formed or altered case group is examined with the help of the cost homogeneity coefficient (HC).

To start with, alternatives that do not involve complexity changes are calculated to achieve improved quality without affecting the system intricacy (i.e. without defining additional case groups). In analysing recommendations that do involve changes in complexity various alternatives are simulated using a standard set of splits (see table 1), until no further improvement in variance reduction can be achieved by further case group differentiation, no further significant split criteria can be found and all received calculable recommendations have been simulated – in part repeatedly – and evaluated.

The results of the calculations are evaluated with regard to the variance reduction achieved, the altered cost homogeneities, the cost difference to neighbouring or related DRGs as well as the number of cases collated in the case group. This appraisal also includes effects that may spread to other DRGs for not all changes may have equally positive results in all the DRGs concerned, in respect of cost homogeneity for example. Finally, those change alternatives that according to an overall appraisal contribute most to improving the quality of the G-DRG system are then implemented.

Split Criteria	Breakdown	Breakdown Parameters
Age	each <	1, 3, 6, 10, 16, 18, 30, 40, 50, 55, 60, 65, 70, 75, 80 years
PCCL	each <	1, 2, 3, 4
Hours of respiration	each <	24, 48, 72 hours
Reason for discharge	each =	079 death, 099 discharge to a rehabilitation establishment. 109/119 discharge to a care establishment/hospice
Therapy	each =	radiotherapy, chemotherapy, radiotherapy or chemotherapy *
Malignant growth	each =	malignant growths *

* Split done on the basis of a procedure list

Table 1: Split criteria of the standard split set

This process ensures both the implementation of recommendations that contribute most to improving the quality of the G-DRG system and an approximation of the maximum homogeneity achievable while maintaining a manageable level of complexity within the G-DRG system.

2.4 Cost Weight Calculation

To calculate the (dimensionless) cost weights, the arithmetical cost average of the case groups is divided by a standard reference parameter (measured in Euros). The

average case group costs result from the data provided by the calculation hospitals which represents a subset of all DRG cases treated in Germany. In contrast, a practically complete picture of inpatient medical care in Germany is provided by the data supplied as per para. 21 KHEntgG.

To compensate for DRG frequency distribution divergence in the case totalities considered the reference parameter for calculating the cost weights is determined on the basis of actual number of cases present in the DRG data as per para. 21 KHEntgG.

Up to and including the G-DRG version for 2005, the reference parameter was so calculated as to ensure an average cost weight of 1.0 for main department inliers in the data collated as per para. 21 KHEntgG.

It is with the G-DRG version for 2006 that the reference parameter is calculated for the first time in such a way that the sum of actual cost weights ascertained for the verified database as per para21 KHEntgG ("Case Mix for Germany") remains constant when the new case-based fixed-sum catalogue is used. This procedure is explained further in ch. 3.3.1.3.

Applying the reference parameter and the arithmetical average cost of each respective case group, the cost weight of each DRG for the various forms of treatment is calculated as follows:

- In the case of main department care, the cost weight is calculated by dividing the arithmetical average of inlier costs in main departments by the reference parameter. At the same time, this cost weight also forms the basis for the analytical derivation of the cost weights of various other forms of care.

  For DRGs of MDC 14 *pregnancy, birth and confinement*, the cost weights for main department care are corrected by the fixed sum costs of the 6.3 costs module when services are provided by an attending midwife.

- In the case of treatment provided by an attending physician the calculation procedure to be applied is dependent on t he applicable number of calculation hospital inlier cases for the respective case group. In as far as the specified preconditions are met, the cost weights and length of stay values are calculated on the basis of the case data of patients treated by an attending doctor. Should the preconditions not be met, the cost weights are derived from the cost weights of main departments in an analytical process.

  The cost weights for the individual combinations of attendant treatment are calculated separately in each case.

The calculation of supplementary surcharges for outliers (above the OVG) and reductions for transferrals and underliers (below the UGV) is made on the basis of inlier average costs without taking the average costs of the main service into consideration.

As in the preceding year, a differentiated calculation rule is applied respective of the specific length of stay constellation of the relevant cases as a whole.

For the underlier reduction, a day-based cost weight is calculated on the basis of the UGV. To ensure an appropriate reflection of the cost situation of underliers in DRGs with a UGV of two days, the case costs are based on one-day occupancy, implicitly resulting in one-day occupancy DRGs.

The calculation of supplementary remuneration for outliers (above the OGV) is preceded by an analysis of the cost situation of an outlier in comparison to that of a "normal lier"(= Length of Stay between UGV and OGV). According to the DRG specific cost distribution, the day-based cost weight is calculated analytically by using either an

incremental cost factor of 70%, by disregarding the incremental cost factor, or with the help of the calculated average day cost of the outlier. Table A-2 in the appendix lists the DRGs of the updated DRG System for 2006 in which the incremental cost factor is disregarded or the calculated average day cost of outliers applied in calculating the supplementary remuneration.

2.5 Supplementary Remuneration

Within the framework of the provisions of para. 17b, section 1, clause 12 KHG services are examined for reimbursement through supplementary remuneration when the following preconditions are met:

- spread over several DRGs
- occurring sporadically without fixed attribution to DRGs
- a definable service with a distinct identification and accounting attribute
- relevant level of cost
- structural difficulties in service provision

The choice of services to be examined is made on the basis of information resulting from the recommendation procedure, InEK's own findings and the services already included in appendixes 2 and 4 of the FPV.

The highly specialised services chosen are divided into the following groups:

- Operative und interventionist procedures: as a rule, these are highly specialised treatment complexes the extent of which varies within the limits set by the service definition. Dialysis and dialysis related procedures belong to this group.
- Provision of blood products: the examination of individual blood products is bound to the provision of a minimum amount, for a specialised service can only be considered to be beyond the usual bounds of treatment and thus economically relevant when this threshold is crossed.
- Provision of medication: this group deals with the provision of special and expensive medication, e.g. those belonging to groups of medication such as cytostatics, antimycotics, immune modulators, immunoglobins, monoclonal antibodies as well as tumour therapy supporting products.

Augmentative case information from the calculation hospitals, the extent of which is stipulated by the InEK, is often necessary for a sufficiently differentiated analysis of the services potentially relevant for supplementary remuneration. This information concerns calculation procedure applied, case designations with augmentative data about the service (e.g. number of services provided, dosage administered in medication provision) in addition to cost data that cannot be recognised as service based in the modular cost presentation. The augmentative data received is subjected to specific data verification of its content.

The procedure for evaluating the supplementary remuneration depends upon the type of service concerned.

Operative and interventional procedures deal with defined services as part of an overall treatment. The case costs supplied in the modular structure of the normal data set provides the basis for calculation with due consideration for the DRG reference. The

costs entailed by examined service are ascertained by a differential cost calculation between case with and cases without the relevant service. The distribution of cases on the DRG case groups concerned is decisive for the differential cost calculation. The reimbursable amount of a supplementary remuneration is thereby equivalent to the weighted average of differential costs of the DRGs concerned.

In the case of dialysis and dialysis related procedures the medial costs of cost centre group 3 form the calculation basis for determining the reimbursable amount due. The costs of the medical and non-medical infrastructure are incorporated in the evaluation by means of a fixed sum supplement. Details concerning the number and/or length of each procedure are also taken into account.

The provision of medication or blood products is characterised by a variable amount administered in each case of treatment. Allowance is made for this fact by creating dosage classes for individual services that are orientated on the dosage and cost distribution of the respective agent or blood product. For supplementary remuneration, the reimbursement relevant cost value of each volume classification is therefore determined by the cost distribution within the respective volume classification. The augmentative cost and service information supplied by the hospitals serves as a basis for calculating the costs associated with the service.

2.6 Transition of ICD-10 and OPS Classifications

A version transition of the diagnosis and procedure information that forms the basis of the G-DRG system update always becomes necessary when a change in the ICD-10-GM and OPS classifications to be applied occurs between the evaluated data year and the year for which the DRG system update is valid.

Transition of identical codes is not necessary.

For non-identical codes the transition mostly of a classificatory transition based on the transition tables of the German Institute for Medical Documentation and Information (DIMDI). However, to some extent it is necessary to deviate from this. Two variants can be set in this respect:

- classificatory transition
- transition based on grouping algorithms

There are three various ways of taking account in the G-DRG system update of newly incorporated ICD-10-GM and OPS classifications for which there is no DIMI transition recommendation:

- The codes are excluded.
- DRGs are established or adjusted according to the new ICD-10-GM and OPS classifications.
- Newly created codes are assigned to old codes similar in content or outlay.

3 2006 Version of the G-DRG System

3.1 Summary of the Results

The 2006 version of the G-DRG system contains a total of 954 DRGs. Table 2 provides an overview of the changes in comparison to the previous year's version:

	No. of DRGs	Change over Previous Year
G-DRG System 2006	954	+ 76
of which in the case-based fixed sum catalogue	912	+ 67
of which not evaluated (appendix 3)	40	+ 7
Of which purely day patient DRGs	2	+ 2

Table 2: overview of the G-DRG System, Version 2006

40 evaluated supplementary remunerations (preceding year: 35) can be found in the in the catalogue of augmentative supplementary reimbursements (appendix 2 FPV). The number of supplementary remunerations to be agreed upon on an individual hospital basis as per para. 6 section 1 KHEntgG (appendix 4 FPV) lies by 42 (preceding year: 36).

For the 2006 version Update of the G-DRG System, details of c. 17.7 million cases from 1,779 hospitals were supplied within the framework of data provision as per para. 21 KHEntgG. The number of calculation hospitals rose by 66 to 214. The number of cases from calculation hospitals that could be evaluated (after correction and plausibility checks) rose to c. 2.9m case (preceding year: 2.3 m cases).

The lively participation in the so-called "recommendation procedure for integrating medical, scientific and other expert knowledge" provided in turn valuable information on starting points for improving the system. A total of c. 2,000 individual proposals were checked by InEK and examined for the possibility of realisation within the framework of the system development.

The work on developing the classifications and derivation of cost weights is carried out according to the procedural principles set out in the body of regulations. Current requirements have let to adjustments in the following areas:

- Derivation of cost weights for treatment by attending doctors has been based on tightened requirements on the data base and the length of stay adjustment further developed by normative analytical derivation.
- Beginning with the 2006 version of the G-DRG system, the reference parameter have been so calculated that the sum of the effective cost weights on a national level ("case mix for Germany") remain constant when compared with the preceding year.
- Cases of provision of day-patient services were to be provided by the calculation hospitals as contact-based data sets and were subjected by InEK to

exhaustive analysis in respect of their representativity in the case-based fixed-sum catalogue.

The focal point of the classificatory overhaul dealt with the following thematic areas:

- Intensive care medicine: the data available from the augmentative data provision has enabled a consideration of intensive care complex treatment in DRG classifications for the first time. Thus, on the one hand, the respiration DRGs A06, A07, A11 and A13 could be further differentiated, while, on the other hand, three new DRGs for complex intensive care therapy in cases without long-term respiration could be calculated.
- Accident surgery: the operative treatment of multiple injuries could be reflected in the somewhat inhomogeneous DRGs of the 2005 G-DRG system's MDC 08 and in several DRGs with large cases numbers, through, amongst other things, the new "surgical intervention on multiple sites of injury" function. The distinction of cases with multiple operations could also be achieved in the area of the *polytrauma* MDC in the basis W02 and W04 DRGs with the aid of this function.
- Stroke treatment: seven new DRGs were created to better reflect the cases of stroke treated in a stroke unit by extending the B69 *transient ischemic attack (TIA) and extra cranial arteriosclerosis* DRG and the B70 *apoplexy* DRG with the criterion of the neurological complex treatment of acute stroke.
- Oncology: one of the important points of the system development in field of oncology is the differentiated representation of chemotherapy. The basis R60 and R63 DRGs have been divided into a total of eleven chemotherapy DRGs on the basis of the chemotherapy OPS codes set apart for 2004. A DRG for *highly complex chemotherapy with surgical intervention in cases of haematological malignant and solid tumours* (R16Z) was established in the operative section of the MDC 17.

The statistical classification quality, expressed by the R2 value as a measurement of variance reduction, has developed in comparison to the preceding year as follows (see table 3):

	G-DRG System Version 2005	G-DRG System Version 2006	Improvement (in %)
R^2 value on basis of all cases	0.6617	0.6805	2.8
R^2 value on basis of Inliers	0.7759	0.7884	1.6

Table 3: comparison of the R^2 variance reduction of the 2005 version of the G-DRG system and of the 2006 version of the G-DRG System (data basis: data of 2004)

3.2 Basis of the System Update

3.2.1 Data Basis

3.2.1.1 Normal Provision of Data

Table 2 expresses the scope of the normal supply of data provided by both data collations (see ch. 2.1). The figures of the cost data collated should be understood as "of which" details of the DRG data collation as per para. 21 KHEntgG, as the DRG data set supplied by the calculation hospitals as per para. 21 KHEntgG is augmented by the cost data details. The figures presented in table 4 are after error correction in the DRG data centre and before data verification by the InEK.

Criteria	Collation of DRG Data as per para. 21 KHEntgG	Collation of Cost Data
No. of hospitals	1,779	214
No. of beds	496,565	91,988
No. cases	17,730,030	3,531,760

Table 4: scope of data supply (as per 8th June 2005)

The collation of DRG data as per para. 21 KHEntgG provides an almost complete picture of the services involved in inpatient and day-patient treatment in Germany. The DRG data sets as per para. § 21 KHEntgG are used i.a. for calculating the reference parameter (see ch. 3.3.1.3).

The number of calculation hospitals has increased by 66 over the preceding year. Nine university clinics have participated in the calculation. The data sets of the cost data collated form the basis of G-DRG classification update after being subjected to verification.

Composition of data supplied

All representations concerning the composition of data supplied encompass the 1,799 hospitals and 214 calculation hospitals referred to in table 2. Diagram 1 portrays the regional composition of the collations according to the state in which the hospitals concerned are situated.

The distribution of hospitals included in the collation of DRG data as per para. 21 KHEntgG practically reflect the care structure of the respective state. This result cannot be expected for the collation of cost data due to the voluntary nature of participation. However, in both collations the states of North Rhine Westphalia, Bavaria and Baden Württemberg consistently provide the greatest proportions of hospitals included.

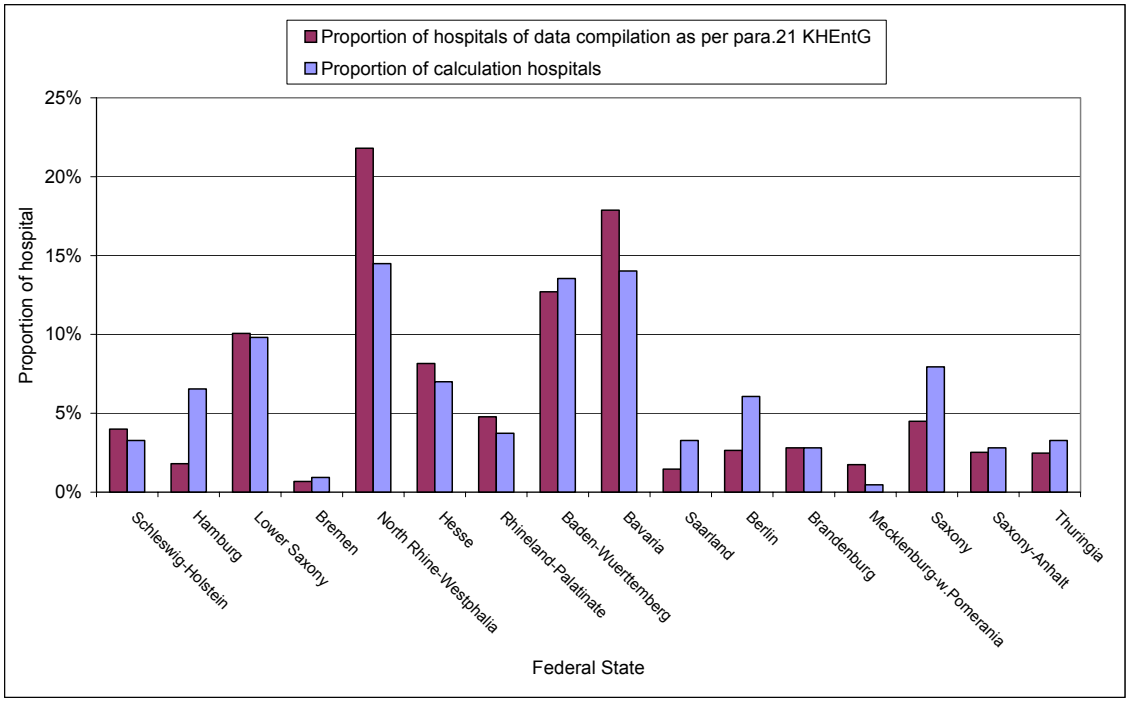

Diagram 1: composition of data collation according to state

The deviation in the proportion of the data collation provided by the various states can be seen in diagram 2 which shows the relative deviation between the proportion of calculation hospitals to the proportion of hospitals participating in the data collation as per para. 21 KHEntgG on a state basis.

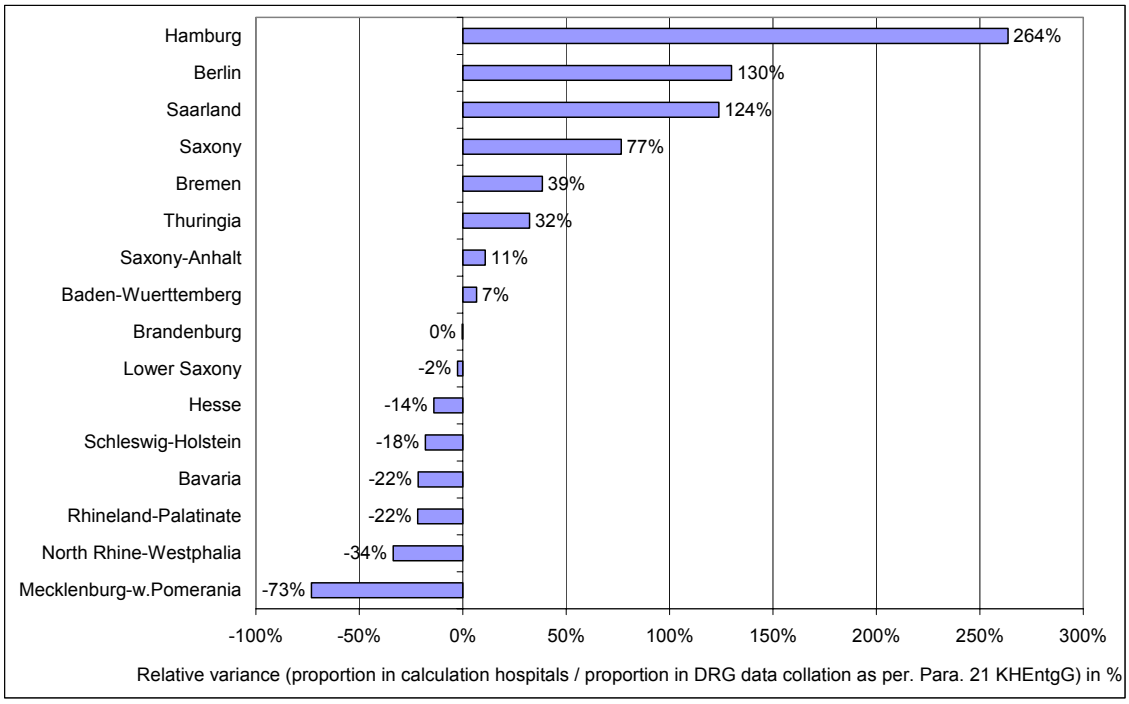

Diagram 2: relative deviation of proportion of calculation hospitals by state to the proportion of hospitals of DRG data collation as per para. 21 KHEntgG

The composition of the data collated regarding the bed number classification of the hospitals is shown in diagram 3. As was already the case in the preceding year, an overweight of hospitals with more than 300 beds can be discerned among the calculation hospitals when compared to data collation hospitals as per para. 21 KHEntgG. On the other hand, smaller hospitals with up to 300 beds form a smaller proportion of the calculation hospitals than in the hospitals of the data collation as per para. 21 KHEntgG. A possible reason for this is the tendency of larger hospitals to be better equipped with the minimum prerequisites of personnel and technical resources necessary for carrying out the case-based cost calculation than smaller ones. At the same time, the higher proportion of large hospitals (often hospitals providing the maximal range of treatment and university clinics) ensures the entire range of services is covered by sufficient numbers of cases.

When compared to the data collation for the 2003 data year, it becomes clear that the proportion of smaller hospitals with up to 600 beds among the calculation hospitals has risen overall while the tendency is for the proportion of larger hospitals with more than 600 beds to fall. The spread of calculation hospitals for the 2004 data year therefore lies “closer“ to the spread of hospitals in the data collation as per para. 21 KHEntgG.

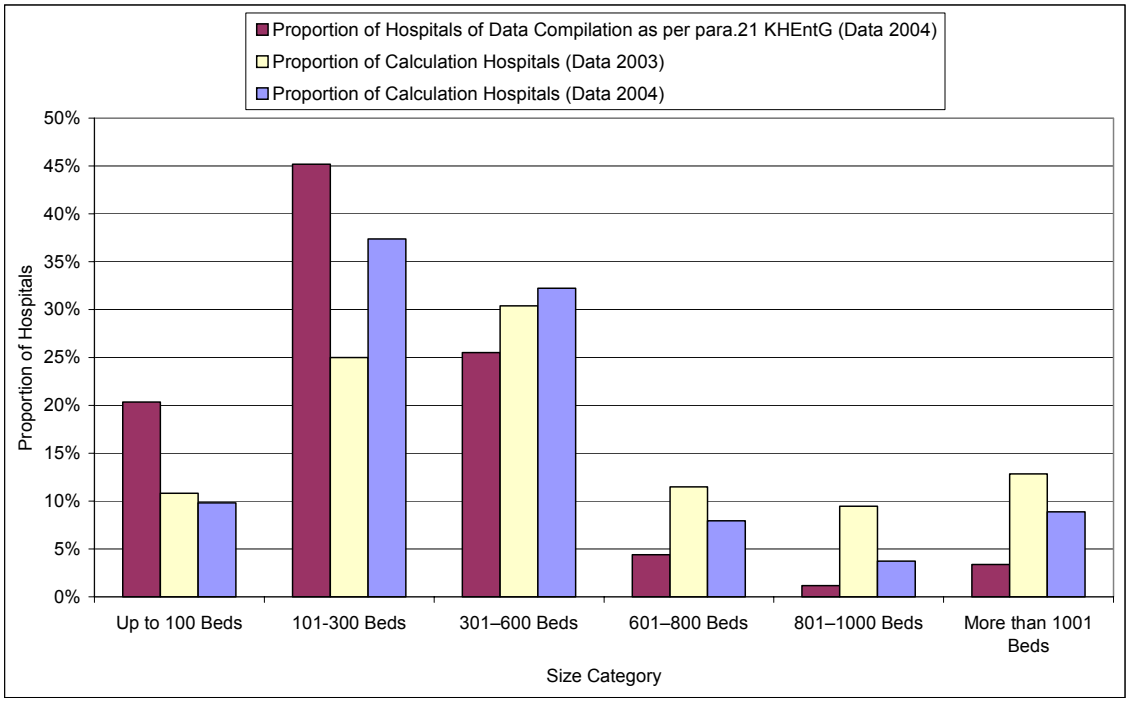

Diagram 3: Composition of data collation according to hospital bed number classification

Diagram 4 that follows shows that compared to the data collation of the 2003 data year, as a tendency, the proportion of charitable non-profit-making hospitals and publicly-run hospitals among the calculation hospitals has risen while proportion of university clinics and privately-run hospitals has fallen.
The spread of calculation hospitals for the 2004 data year therefore lies “closer” overall to the spread of hospitals in the data collation as per para. 21 KHEntgG.

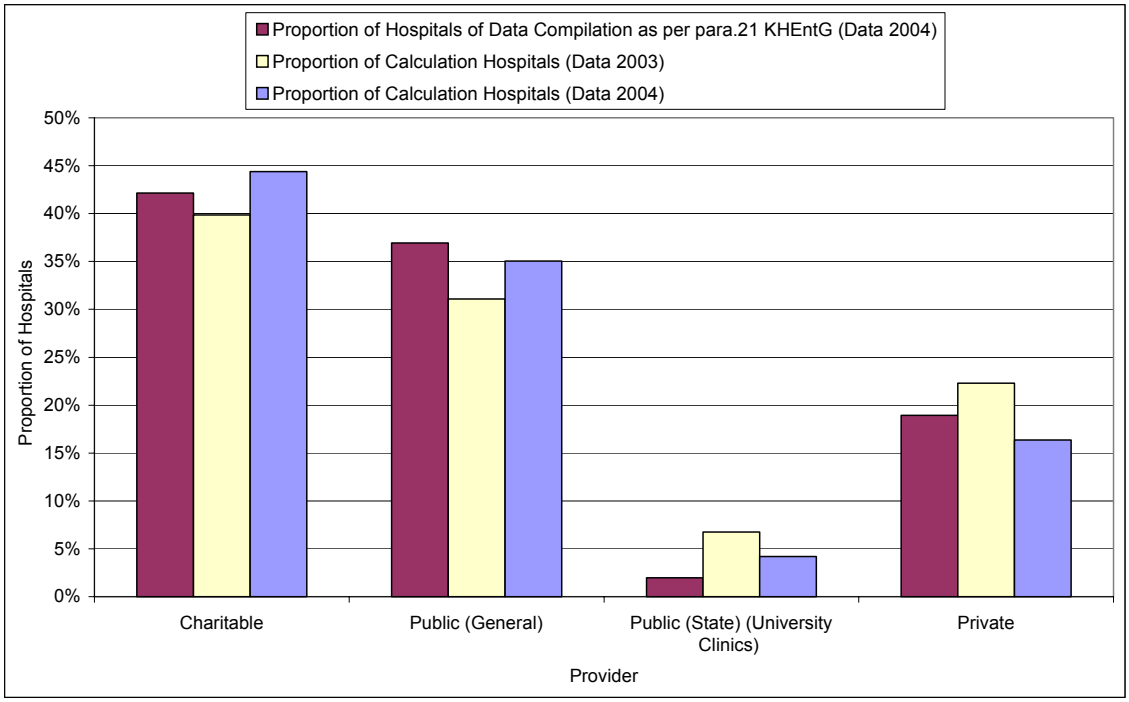

Diagram 4: composition of data collation according to hospital provider

Scope of Data Supplied

The proportion of flawed data sets among the entire data provided (DRG data as per para. 21 KHEntgG and cost data) amounts to 0.7% according to the DRG data centre. This error ratio is ascertained on the basis of each hospital's last respective data supply after it has been subjected to the error correction process.

The DRG data centre has provided the InEK with data on a total of 3,738,107 cases from the calculation hospitals.

This is then cleansed of all unmatchable data sets (only service data/no cost data: 4.1%; only cost data/no service data: 1.4%). Cases with no DRG relevance (out-patient cases without subsequent inpatient treatment: 4.3%; psychiatric, psychosomatic and psychotherapeutic cases: 0.3%; patient escorts: 0.8%) are transferred to a separate data pool and are disregarded. The percentages refer to the total number of cases provided.

An average of 2.5 procedures (with a maximum of 100 procedural details possible per case) and 3.9 auxiliary diagnoses (with a maximum of 49 auxiliary diagnoses details possible per case) are specified per case. The cost data per case was specified in an average of 26 various cost modules.

3,531,760 cases with both cost and service data were available after data sets with matching problems and no DRG relevance had been excluded (see table 4).

Cleansing and Correction

Table 5 shows the proportion of data subjected to various cleansing and correction measures (see ch. 2.2). The details refer to the 3,531,760 checked data sets:

Cleansing / Correction	Proportion of Data Sets (in %)	Action
Case combination	0,7	Removal from database
Source correction	19,2	Correction of personnel costs (correction factor: 1,0941)
Supplementary remuneration correction: dialysis costs	0,7	Correction of dialysis costs
Supplementary remuneration correction: cost of factor compounds in haemophilia treatment	0,03	Cost separation
Miscellaneous supplementary remuneration correction: administration of medication and blood products	1,3	Correction of medication material costs (individual cost allocation)
Miscellaneous supplementary remuneration correction: operative and interventional procedures	0,5	“Removal“ from the database
Transferral cleansing	4,1	Removal from the database (with exceptions)
Outlier cleansing	0,6	Removal from the database

Table 5: results of data cleansing and correction (based on 3.531.760 data sets)

Scope of Data Following Cleansing and Plausibility Verification

2,851,819 data sets were finally available for processing following plausibility verification, cleansing and correction (see ch. 2.1 and ch. 2.2). That means that in total 19.3% of the 3,531,760 checked data sets from the calculation hospitals have been excluded from the calculation through cleansing and data verification of their content.

The breakdown of these 2,851,819 validated data sets according to type of department and transferral is contained in table 6 as follows:

Department Type	Cases not Transferred (Numbers of Cases / Proportion in %)	Cases Transferred (Numbers of Cases / Proportion in %)	Total
Treatment in Main Department	2,419,829 84.9	150,601 5.3	2,570,430 90.1
Treatment by Attending Physician	31,409 1.1	402 0.0	31,811 1.1
Day-patient Treatment	248,270 8.7	1,308 0.0	249,578 8.8
Total	2,699,508 94.7	152,311 5.3	2,851,819 100.0

Table 6: Breakdown of cleansed and corrected database according to type of department and transferral status (percentage details based on a data base of 2,851,819 cases)

Of the 150,601 transferred cases, all 6,047 cases of the 78 DRGs where cases transferred to main departments are included in the calculation (see table A-1 of the appendix) were retained.

This results in 2,570,430 – (150,601 – 6,047) = 2,425,876 validated cases as the basis for the G-DRG system update.

3.2.1.2 Augmentative Data Provision

The G-DRG system update is provided every year with both the DRG data as per para. 21 KHEntgG as well as the data providing case cost information supplied by the calculation hospitals on a voluntary basis. Apart from this “normal” data provision, further augmentative case information is required from the calculation hospitals to provide a sufficiently differentiated data basis for the analysis and evaluation of the relevant services.

The scope of the augmentative data provision was specified by InEK. The calculation hospitals were requested to make the data available as far as possible.

The additionally requested data consisted of

- Procedural information,
  by which the hospitals provide information about available data and the calculation procedure applied that serves to ensure satisfactory data quality,
- Service data,
  which deals with the identification details of the case of treatment and well as details concerning the number of services provided (in the case of medication: date of provision and dosage administered),
- Cost data,
  concerning the provision of medication and blood products the costs of which

cannot be identified on a service-based level in the modular representation of costs.

Diagram 5 presents an overview of the data made available by the calculation hospitals:

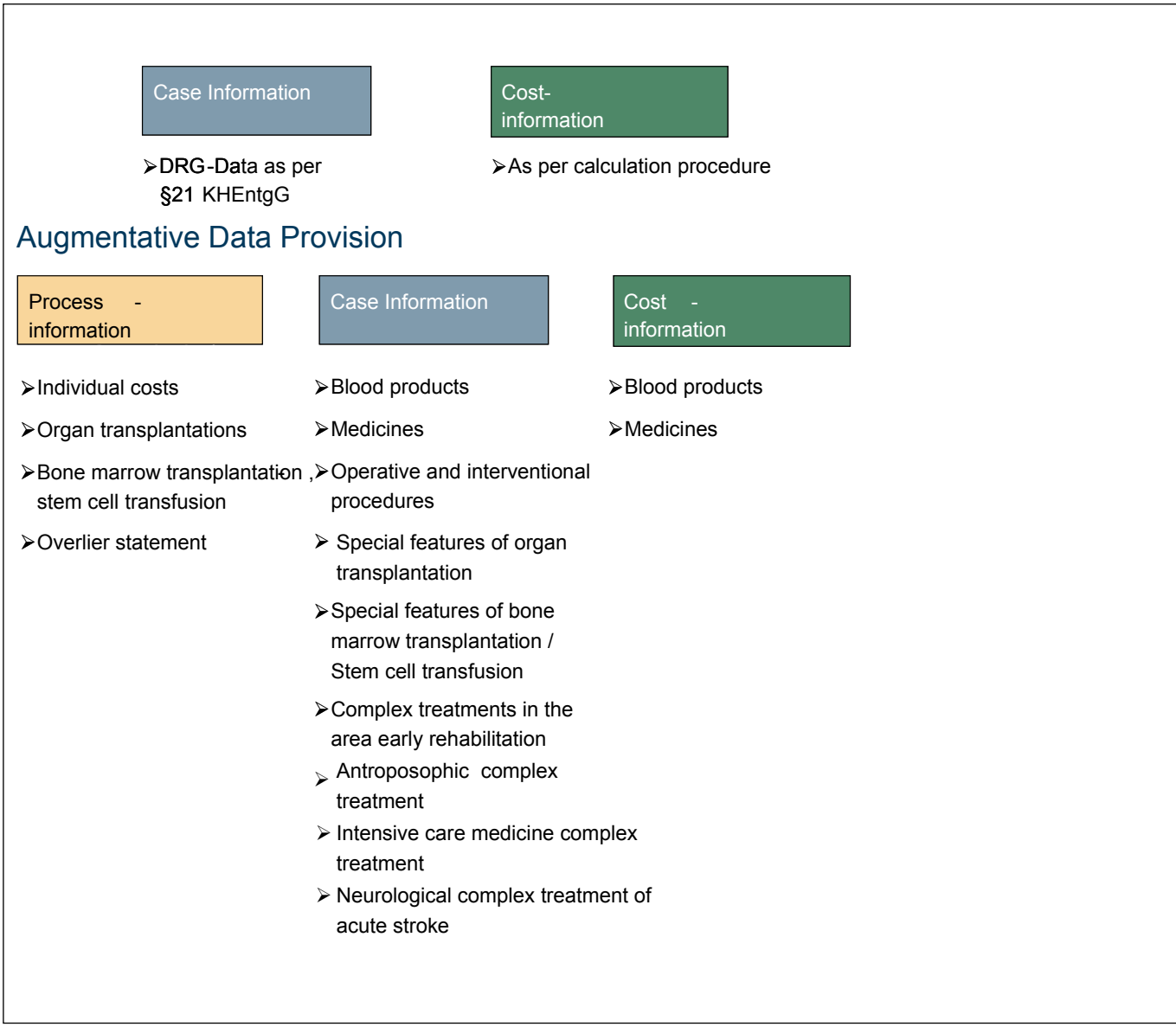

Diagram 5: overview of data provision

Providing the additionally requested case information entails a considerable amount of effort in both time and personnel for many hospitals. Despite this, a remarkably high rate of data return has been registered, for which the hospitals are here explicitly thanked.

- Procedural Information

  More than 90% of calculation hospitals provided information concerning the basis of the data available in their establishments and the calculation procedure

applied. In this process, it was especially important to receive information about the hospitals' possibilities for apportioning the individual costs of particularly expensive practical material (implants, blood products, expensive medicines). Many of the highly specialist services include the use of such material, making a differentiated and complete case-based apportioning of costs in a hospital especially significant.

- Service Data

Last year, a few enquiries concerning special areas of service were only sent to individual hospitals; this year, such a restriction was set aside and details of all areas of service were requested from all calculation hospitals. A total of 179 hospitals have provided details of 203,284 cases. Table 7 shows the extent of the augmentative service data provided:

Data	No. of Hospitals	No. of Cases
Case data concerning operative and interventional procedure	116	6,338
Case data concerning blood products	136	19,326
Case data concerning medication	128	70,950
Case data concerning dialysis	111	25,853
Case data concerning transplants and specific features of organ transplants (stays for evaluation, level of urgency)	14	1,144
Case data concerning early rehabilitative complex treatment/ early rehabilitation	49	23,653
Case data concerning neurological complex treatment (incl. cases with Stroke-Unit)	27	11,543
Case data concerning intensive care medicine complex treatment	33	38,092
Case data concerning further areas of complex treatments (e.g. naturopathic and anthroposophic medicine complex treatment)	8	5,898
Case data concerning specific characteristics of stem cell/ bone marrow transplantation	11	487

Table 7: overview of the augmentative service data provided

- Cost Data

Service-based and case-based cost data is needed for the provision of blood products and medication. Table 8 shows the extent of the data received:

Data	No. of Hospitals	No. of Cases
Cost data concerning blood products	130	18,428
Cost data concerning medication	120	68,222

Table 8: overview of augmentative cost data provided

3.2.2 Recommendation Procedure

3.2.2.1 Main Features of the Procedure

As in previous years, the self-governing partners as per para. 17b KHG commissioned InEK with carrying out the so-called "Recommendation Procedure for Integrating Medical, Scientific and Other Expert Knowledge" by means of a regulative process. The tried-and-tested concept of the procedure (see points one to four) has been continued. The recommendation tool, however, has been overhauled to make the presentation of proposals easier for the proposer through simplified forms with detailed instructions for filling them out.

1. Proposals could be submitted to InEK exclusively by e-mail.
2. Call-backs in unclear cases were assured only for proposals made up until 28th February.
3. Proposals for changes to the 2005 version of the ICD-10-GM or 2005 version of the OPS could be submitted exclusively to the German Institute for Medical Documentation and Information (DIMDI).
4. The names of the proposers and a brief description of the proposals' contents were published in accordance with the resolution passed by the self-governing partners as per para 17 b KHG during a top-level discussion on 9th February 2004.

The "Recommendation Procedure for Integrating Medical, Scientific and Other Expert Knowledge in the G-DRG System Update for 2006 (Recommendation Procedure 2006)" was begun on 29th November 2004 with the publishing of the procedural details on the internet. The procedural changes adopted for 2005 have proved themselves by the number of proposals submitted at an early stage, enabling unanswered questions to be cleared up in an intensive dialogue with the proposer. In part manifold call-back queries were made to about 40 of the proposals received which resulted in a significant improvement in the quality of the recommendation procedure.

All proposals received were registered in list of received proposals. This compilation of proposals containing the proposal number, the name of the proposing institution/individual and the quintessence of the proposal in the form of keywords was published on the InEK internet site on 24th May 2005.

Analogous to the procedure of the preceding year, the input was systematically processed and broken down into so-called "Minimal Units of Processing" (MUP). Proposals capable of simulation were scrutinised on the basis of the data provided by the calculation hospitals. The process of simulation and evaluation of proposed

changes to G-DRG classifications is described in greater detail in chapter 2.3. Those proposals not capable of simulation were incorporated into the G-DRG system update by increasing problem awareness in the area of the themes mentioned.

The procedure is concluded by informing the proposers of the fate of their proposals. In this, the extent to which the proposals submitted have been considered in the G-DRG system update and the reasons therefore, are set out in detail.

3.2.2.2 Participation

Participation in the process was, as in previous years, very brisk. A total of 228 recommendation communications were submitted (29 fewer than the preceding year). Of these, 124 were submitted by specialist societies or associations and a further 104 came from individual persons/institutions. As a recommendation communication could consist of multiple individual proposals or parts (that is, proposals to various problems or DRGs), a total of 1,670 individual proposals were submitted, which represents a considerable increase in the number of individual proposals over the previous year (1,370). These were augmented by approximately 100 individual proposals arising from previous recommendation processes that could be calculated this year for the first time.

The majority of proposals dealt with the specialist areas of surgery, accident surgery/orthopaedics, internal medicine, oncology, cardiology, neurology and early rehabilitation, whereas as only a few proposals were submitted on themes such as severe burns, craniocerebral trauma and HIV. As was the case in the preceding year, the largest proportion of proposals was submitted by specialist medical bodies. A detailed list of proposing institutions, organisations and individuals is provided by the proposal compilation available for downloading on InEK's internet site.

3.2.2.3 Evaluation and Consideration of Proposals

The proposals submitted the previous year varied in their precision. The agreement of the self-governing partners as per para. 17 b KHG on the introduction of a system of fixed-sum remuneration stipulates that solutions be found within the G-DRG system. The degree to which the proposers took this into account varied greatly. Notice has been drawn in answering the individual proposals, in the final report and in lectures and presentations on the subject of the 2005 G-DRG system update to the difficulties of taking into account imprecise proposals or those that lie outside the stipulated framework. In the case of the 2006 recommendation procedure, more than half the proposals submitted could be simulated directly using the data from the calculation hospitals. But a move toward solutions within the system also took place in the case of proposals that could not be directly simulated. Proposals that could not be directly simulated were especially:

- Proposals for new formulation/rededication of ICD and OPS codes

  Updating the ICD-10-GM and OPS is the task of the German Institute for Medical Documentation and Information (DIMDI). Attention was drawn to this in the description of the procedure. Proposals for the new formulation of codes received within the framework of the procedure have been forwarded to the

appropriate DIMDI department, but without resulting in a prolongation of DIMDI's time limit for submissions (31st March 2005).

- Proposals for funding by supplementary remuneration

  Determining supplementary remuneration requires additional case information and a methodology of its own. Chapter 2.5 deals with determining supplementary remuneration in depth.

- Proposals for changing the CCL Matrix

  Revision of the CCL Matrix is basically restricted to cleansing from blatant incongruities. The final report will later deal in detail with changes to the CCL-Matrix.

- Proposals for creating new DRGs on the basis of new ICD /OPS codes

  Simulations using the data from calculation hospitals could only be based on codes already existing in the data sets or supplied by the augmentative data provision. Requests for new codes were dealt with as above. Should DIMDI incorporate these codes in its classification, they could then be enciphered in 2006 and will be available for calculation data analysis in 2007 at the latest. Proposals based on the 2005 codes were, in the main, derived from codes from 2004. Where this was not possible, these proposals were earmarked for renewed processing next year.

- Duplicates

  Around 16% of the proposals submitted were identical in text or content to those presented by other institutions/individuals. No advantage was achieved by manifold submission. Not prioritisation took place in the case of multiple nominations.

- Proposals for changes to the German Encoding Guidelines

  In the revision of the German Encoding Guidelines for 2006, the slim-down and restriction to circumstances that are explicitly to be regulated according to the encoding guidelines that had already begun the preceding year has been continued. Changes to content were undertaken only to a very small degree. Proposals for changes to the encoding guidelines were incorporated in the discussions.

- Proposals for changes to the framework of the G-DRG system

  Proposals that fundamentally deviated from the framework established by the 2005 Case-Based Fixed-Sum Agreement for Hospitals (FVP) or that lay outside the system architecture of the G-DRG system were checked for information that could be simulated within the G-DRG system or were incorporated in discussions of change to the methodical starting points (e.g. overlier remuneration).

- Proposals for the deletion of individual specialist areas/ illnesses/ establishments.

  Only a few proposals for the deletion of individual specialist areas/ illnesses/ establishments were submitted during the procedure. The primary goal of the procedure was to find solutions within the DRG System. However, several DRGs in the 2006 case-based fixed-sum catalogue were not cost weighted (appendix 3 of the FPV 2006) and will therefore have to be the subject of local negotiations between the hospitals and those who bear the costs. This non-

allocation of cost weighting was not carried out by request but decided upon on the basis of an overall appraisal of objective criteria such as homogeneity, proportion of longliers, numbers of cases etc.

All of the more than 1,000 proposals received that could be directly simulated were calculated and evaluated using the calculation data – in some cases a number of times. In addition, analyses of multiple variations of the proposals were often undertaken. Roughly 15% of the proposals could be adopted directly or in the spirit of the proposer. The proportion of adopted proposals was therefore slightly smaller than in the preceding year. But, even in the case of the other proposals, the problems described were taken onboard and solutions for them intensely sought. And so, a large number of proposals for change – inspired by these problems – were developed before and during the calculation process. The total number of simulated changes was therefore three times higher than the number of proposals submitted capable of simulation (a total of 3,118 variations).

3.3 Main Focus of the Update

3.3.1 Adaptation of the Methodology

3.3.1.1 Calculation of Cost Weight for Treatment by Attending Physicians

The cost weight for treatment by attending physicians could be independently calculated in 15 DRGs of the 2005 case-based fixed-sum catalogue. The remaining 747 DRGs were derived by normative analyses from the catalogue's cost weights of treatment in main departments and appropriately lowered in accordance with para. 21 KHEntgG in the case of deviance from DRG data length of stays where applicable. For the analytical deduction, details of length of stay were adopted unaltered from the catalogue of main department treatment.

Calculation

Prior to calculation, detailed analyses were carried out to improve the quality of the data for calculating the 2006 catalogue. With the aim of independently calculating as many DRGs as possible and accurately reflecting the services provided by attending doctors in the case-based fixed-sum catalogue, InEk subjected the calculation data for service provided by attending doctors to additional plausibility and conformity checks. At the same time, the preconditions for calculation were once again raised in comparison with the preceding year. Data sets were used for calculation when

- treatment was exclusively by attending doctor (no mixed cases),
- there were at least 40 cases per DRG, from at least three hospitals,
- the homogeneity coefficient of the calculation was at least 65% and
- a single hospital provides no more than 66% of the data sets for the calculation.

To carry out a stochastically stabile calculation, the preconditions for calculating those DRGs displaying a deviation of more than 30% from the respective cost weights for

treatment by main departments after the above conditions had been applied were tightened once again:

- at least 80 cases must be present per DRG, from at least three hospitals,
- the homogeneity coefficient must be at least 70% and
- no more than 50% of the data sets of the calculation may be provided by a single hospital.

54 DRGs could be calculated on the basis of these conditions using 16,678 data sets. These DRGs are listed in the appendix (table A-3). These DRGs represent about 63% of all plausible cases of treatment by attending doctors in Germany capable of being charged when the entirety of the DRG data supplied as per para. 21 KHEntgG is considered.

The cost weights of attending surgeons/doctors was ascertained by dividing the arithmetical average inlier costs of the respective main department treatment DRGs by the reference parameter. The cost weights of attending surgeons for the independently calculated DRGs are on average 27% lower than those of the respective main department (see table 9).

Difference in CW	DRGs Calculated	DRGs Derived
Up to 10%	3	188
From 10% to 20%	7	477
From 20% to 30%	25	29
From 30% to 40%	17	1
From 40% to 50%	2	2
Average (weighted according to number of cases)	27.06%	15.07%

Table 9: difference in cost weight of attending physician treatment compared to main department treatment

Derivation by Normative Analysis

The modified derivation by normative analysis of the cost weight of attending surgeons/doctors for DRGs not calculated independently has been further developed. As in previous years, deducting the average personnel cost for physicians from the relevant main department treatment DRG modules formed the basis for ascertaining cost weight. These are the average costs of the modules “personnel costs for service rendered by physicians” on the normal ward, in the area of surgery, in diagnostic/therapeutic cardiology as well as diagnostic/therapeutic endoscopy.

As in the preceding year, the results of an analysis of the length of stay structure (DRG data as per para. 21 KHEntgG) have been used to achieve a length-of-stay-based cost adjustment for the normal ward – this year, however, adjusting the cost both upwards and downwards. The normal ward length-of-stay-based costs in the areas of nursing care, functional service as well as medical and non-medical infrastructure have been identified. Where a variance in the average length of stay occurred between main department and attending doctor department, the aforementioned average daily cost

was adjusted on the basis of the length of stay difference. An adjustment was only carried out, however, when at least 30 cases of treatment exclusively by attending doctors were present in the DRG data as per para. 21 KHEntgG. The exact variance (rounded after the decimal point) was applied in calculations to ascertain the deviation in length of stay. To safeguard the results from random statistical influences the variance in length of stay had to be less than 20% of the main department length of stay. An adjustment of the average normal ward costs was made for 483 DRGs. This resulted in a length-of-stay-based increase for 137 DRGs and a length-of-stay-based reduction for 346 DRGs. In the case of 211 DRGs only the costs of the medical personnel were liable to deduction (see table 10).

Overall, the cost weights for attending surgeons/doctors of the derived DRGs are on average 15% lower than those of main department treatment DRGs (see table 9).

It was furthermore decided on the basis of the analysis of the length of stay structure to ascertain the length of stays for cases treated exclusively by attending doctors of DRGs derived by normative analysis with the help of the DRG data as per para. 21 KHEntgG. To minimise random statistical influences, the length of stay of the main department was used when less than 30 cases of treatment were available in the DRG data as per para. 21 KHEntgG. The upper length of stay margin was derived by using the customary rules. Accordingly, the upper length of stay margin for the catalogue's treatment by attending doctors was lowered 255 times and raised 65 times. The lower length of stay margin remained unchanged when compared to main departments of all DRGs derived by normative analysis.

No case of treatment by attending physicians could be found in the DRG data as per para. 21 KHEntgG for 165 DRGs in which treatment was calculated for main departments. These DRGs have been removed from case-based fixed-sum catalogue for treatment by attending doctors.

Calculation of the cost weight for the remaining three forms of treatment has been carried out separately:

- cost weight in the case of attending surgeons/doctors and attending anaesthetists
- cost weight in the case of attending surgeons/doctors and attending midwives
- cost weight in the case of attending surgeons/doctors, attending anaesthetists and attending midwives

The cost weights of the above mentioned forms of treatment were ascertained for both the independently calculated DRGs and those derived by normative analysis by deducting the relevant cost modules of each case as in previous years.

To summarise, in addition to the deduction of the doctors' costs (see above), the length-of-stay-based modules were supplemented or reduced in 483 DRGs. The normative derivation has thereby been significantly mitigated and the reductions are in general more moderate. No other adjustment than deducting the personnel cost for doctors was made in around a third of DRGs (see table 10).

Procedure	No. of DRGs
LOS-based adjustment	483

(supplements and reductions)	
Only doctors' costs deducted	211
Independently calculated	54
Total	748

Table 10: overview of DRG calculation methodology for treatment by attending physicians

3.3.1.2 Definition and Evaluation of Day-patient Treatment

The self-governing partners explicitly incorporated in their decision of December 2004 a calculation remit to reflect day-patient treatment and services. To put his decision into practice, the calculation handbook was augmented with a section providing the rules and regulations for calculating day-patient services. At that same time, it was agreed that data sets as per para. 21 KHEntgG have to be supplied by the calculation hospitals in a day-based form with the patient number as compulsory information. The agreement according to para. 21 sections 4 and 5 KHEntgG allows a choice in communicating day-patient services between a day-based form and a case-based form; whereas providing the patient number is voluntary due to a discretionary clause.

The basic idea was to enable an analysis of the individual days of treatment of day – patient services and to consolidate them again into one case within the calculation control sample with the help of the patient number where applicable. With this method of registration no precedent for a universal day-based remuneration of day-patient services has been created. What is more, this method of data supply leaves the decision between day-based and case-based remuneration completely open, for a definitorial consolidation of several treatment days for a case-based remuneration is possible after the day-patient services have been analysed.

The calculation of day-patient services should result in cost homogeneity of both a day-based and a case-based remuneration. The algorithmic representation of the DRG case-based fixed-sum catalogue should basically be preserved. Day-patient services are identified in the DRG data as per para. 21 KHEntgG by the information "hospital treatment, day patient" as the ground for admittance to hospital. In this, an accounting attribute alone identifies day-patient services.

Specifications for the Calculation

The following specifications have been established for calculating day-patient case-based fixed sums. Five days of treatment per day-patient case is the average contained in the data supplied. A minimum of 30 data sets from at least three various hospitals should be provided for each case-based fixed sum to be calculated to ensure a statistically stabile calculation. An average treatment length of five days results in a minimum of 150 day-patient data sets for each case-based fix sum to be calculated. The homogeneity coefficient had to be at least 55% and no single hospital was to provide more than 66% of the control sample's cases of the case-based fixed sum being calculated. Two individual hospitals should not jointly dominate the control sample. Therefore, any two hospitals were to provide jointly less than 95% of all calculation cases. The calculation preconditions of a minimum of 150 data sets from at

least three different hospitals were not too restrictive; they resulted in the rejection of about 11,000 data sets out of 301,000 (a rejection rate of 3.7).

Problem Areas of Calculation

Due to the late announcement of alterations to the calculation handbook and in appendix 2 of the agreement according to para. 21, sections 4 and 5 KHEntgG, the calculation hospitals were forced to convert their case-based documented day-patient data sets into day-based data sets. In this, the hospitals in part experienced the problem that the case-based procedural documentation bore only one date for all procedures carried out. A simply date-oriented conversion into day-based data sets was therefore not possible. This situation resulted in the day-based data sets of an individual hospital occasionally not differing in their procedure documentation in these cases. By reverse, this also meant that within the scope of cost unit accounting these data sets were all calculated with the same costs. Considerable obstructions were thus put in the way of a thorough analysis of the data sets on a cost and procedure level. In a few calculation hospitals it was no longer possible to establish day-patient cost centres in time. A simplified calculation process was applied in part as a fall back in these cases. This resulted in all day-patient data sets being calculated with the same degree of cost irrespective of the actual service rendered. Distribution of medical and especially non-medical infrastructure costs took place to a partly implausible degree. Data sets that were conspicuous in the plausibility and conformity checks because of their extremely rouge infrastructure costs were excluded from further calculation processes.

The analysis of the day-patient data sets for potential case-based fixed-sum levels revealed further problem areas that will have to be resolved to ensure a service-compatible reflection of day-patient services. For example, cost spreads with several peaks could be observed. This is usually an indication that the service description of the data sets considered does not lead to cost homogenous case-based fixed sums. Accordingly, a better service description has to be found. For example, day-based day-patient services in the case of head pain treatment could encompass a diagnosis by exclusion, medication adjustment, acupuncture treatment, group therapy for chronic pain management or invasive treatment for pain. The data situation in these cases, however, offered no possibility for an improvement of the service description. The oncological day-patient data sets displayed a high variability in the case of medication. Plausible cost-spans between a few Euros and several thousand Euros were not rare. Since no information regarding the medication administered can be provided in the DRG data sets as per 21 KHEntgG, a more exact evaluation of this variability is, on the one hand, extremely difficult. On the other hand, the basic problem of a high cost spread dependent on the medication therapy administered would remain even if this medication information were to be available.

Pseudo-homogeneity

The calculation uncertainties described above and the associated data sets with equally high costs within a day-patient case resulted in the homogeneity dimensions used in evaluation being implausibly high. With this a pseudo-homogeneity was indicated that in fact did not exist, but instead was caused by an inappropriate distribution of costs over the day-based data sets. For example, when a hospital carried out a simplified calculation and allocated equally high costs to all day-based data sets, a 100% homogeneity for this hospital was established since no cost spread

whatsoever was present. Accordingly, an additional examination of homogeneity on a hospital level was necessary as well as considering homogeneity on a case-based fixed-sum level. The problem of pseudo-homogeneity does not exist in this form for the other areas of calculation in the case-based fixed-sum catalogue.

Conclusion

In conclusion the self-governing partners have agreed to incorporate only day-patient dialysis into the case-based fixed-sum catalogue for 2006. Day-patient dialysis for adults and for infants up to 15 years of age could be presented seperately, whereby only the adult day-patient dialysis DRG (L90B) could be cost weighted. Remuneration on an individual hospital basis is to be agreed according to para. 6, section 1 KHEntgG for the infant's day-patient dialysis DRG (L90A) as is the case of the remaining day-patient services.

Perspective

A consensus on service definition is urgently necessary to ensure a proper reflection and calculation of day-patient services. The absence of a service definition leads as a result to the inappropriate backup solution of identifying day-patient services by an accounting attribute. A further disadvantage arises from the fact that day-patient services will have to be documented differently for accounting than for calculation purposes. Whereas accounting of day-based day-patient remuneration is carried out on a case basis (one case per quarter), the calculation handbook requires calculation be done on a day basis. The retrospective conversion of case-based data sets into day-based data sets has led to considerable difficulties, especially in the case of information concerning procedures. This can be remedied by an integrated day-based documentation of day-patient services, which entails an adaptation of existing hospital information systems where necessary.

3.3.1.3 Calculation of the Reference Parameter

The reference parameter has previously been so defined that the median cost weight of all inlier treated by main departments in the plausible DRG data as per para. 21 KHEntgG corresponded to 1.0. This process of standardisation conformed completely with international conventions. However, the development methodology could give rise to a technical effect expressing itself in a general change in cost weights that would lead to a corresponding change in the individual base rates. In the case of generally sinking cost weights this led to a rise in the hospital-specific base rate, and in the case of generally rising cost weights to a corresponding fall in the hospital-specific base rate. Where the budgetary and remuneration negotiations could not be carried out prospectively, a technically induced liquidity effect resulted automatically since the hospital-specific base rate could only react to the technical effect with a time delay.

To minimise this technically-induced effect on liquidity the self-governing partners had agreed on a federal level to set a different basis for the reference parameter calculation, beginning with the calculations for the 2006 case-based fixed-sum catalogue. Accordingly, the reference parameter for the 2006 case-based fixed-sum catalogue was so defined that the sum of the effective case weights remains constant on a national level ("case mix for Germany"). The effective cost weight results from the

arrangement of treatment cases into groups according to the accounting specifications of the FPV. This means that deductions in the case of falling below the lower length of stay margin or transferral and supplementary remuneration in the case of exceeding the upper length of stay margin are taken into account as are case consolidations in the case of re-admissions and transferral back. This procedure minimises on a national level the effects on liquidity in the case of non-prospective budgetary and remuneration negotiations and continued validity of previous hospital-specific base rates. The procedure for determining the reference parameter is described in detail in the following section.

Data Base

In principle all the DRG data as per para. 21 KHEntgG from the 2004 data year is drawn upon in determining the effective cost weights. Treatment cases that featured no cost weight in the case-based fixed-sum catalogue for 2005 or feature none in the catalogue for 2006 were excluded from consideration. This included

- day-patient services for which remuneration had been settled exclusively on the basis of para. 6, section 1 KHEntgG,
- cases of treatment that were not reimbursed in either 2005 or 2006 with the case-based fixed-sum catalogue (remuneration according to para. 6 section 1 KHEntgG from appendix 3) and
- cases of treatment with attributes that cannot yet be identified (e.g Intensive scores).

The DRG data as per para. 21 KHEntgG was subjected to plausibility verification. Following the error processing procedure in the DRG data centre, that section of the medical plausibility verification for calculation hospitals that could be applied to all data sets in their entirety was carried out to check for correct application of German encoding guidelines. According to the specifications for data provision as per para. 21 KHEntgG, cases of treatment consolidated to meet accounting specifications are to be transmitted to the DRG data centre exclusively as consolidated cases of treatment. In 2004, not every hospital under KHEntgG jurisdiction had done its accounting all year round on the basis of the DRG case-based fixed-sum catalogue. AS a result, the data sets of the 2004 data year could not yet be completely consolidated according to the accounting specifications for case consolidation in cases of re-admission or transferral back. For this reason, the DRG data sets as per para. 21 KHEntgG were checked to see whether they should have transmitted in consolidated form on the basis of the FPV accounting specifications. In cases where the conditions for consolidated were met, the respective data sets were retrospectively consolidated. The effective cost weights resulted from the accounting specifications of the FPV. To extrapolate the calculation control sample to the universal base (= DRG data as per para. 21 KHEntgG) it was assumed that the median case costs of a DRG in the universal base were commensurate with the median case costs of a DRG in the calculation control sample.

The modification of the case-based fixed-sum catalogue for stroke treatment (compare ch. 3.3.2.23) could not directly be taken into account to a proper degree in determining the effective cost weights. This was due to the fact that the encoding of the DRG data as per para. 21 KHEntgG for the year 2004 did not yet contain the OPS code for complex stroke treatment which was introduced in the 2005 code update. Stroke complex treatment was thereby evaluated a too low a level on the basis of the data from 2004. This data-contingent distortion of the case-mix could be assessed on a

national level and taken into account accordingly in the standardisation process. Analysis of the calculation control sample showed that stroke treatment displayed more or less the same sum of effective cost weights through the development of the case-based fixed-sum catalogue, but that the distribution of the effective cost weights over the individual cases of treatment differed, however. The effects of the modification for stroke treatment could be estimated on a national level on the basis of the results of this analysis.

That changing the supplementary remuneration catalogue alters hospitals' sums of revenue on the one hand, and that the costs associated with the supplementary remunerations are calculated out due to the full cost approach in the calculation control sample on the other, is to be taken into account in keeping the sum of the effective cost weights constant. The thereby associated influence on the sum of the cost weights could also be estimated on the national level. For the modification of the case-based fixed-sum catalogue for stroke treatment and the altered cleansing of full costs in the calculation of supplementary remunerations a total of 32,953 effective cost weights were estimated on a national level.

A total of 15,476,804 effective cost weights for the case-based fixed-sum catalogue for 2005 result on the basis of the DRG data as per para. 21 KHEntgG for the 2004 data year. Using identical DRG data, the total of effective cost weights for the 2006 case-based fixed-sum catalogue is 15,443,851. The difference is exactly 32,953. The reference parameter for determining the cost weights for the 2006 case-based fixed-sum catalogue thereby amounts to 2,836.00 €.

A comparison of the reference parameters for 2005 and 2006 is not possible since the two reference parameters were calculated using different methods and a relative or absolute comparison of reference parameter size is of no explanatory significance. The method chosen ensures that the effect on liquidity is minimised on the national level. A liquidity effect will arise on a state level or on the level of individual hospitals due to a structure of treatment cases that deviates from the national average. The method does not cement the structures existing in the data year of 2004, since the sum of effective cost weights on the basis of the DRG data as per para. 21 KHEntgG for the respective data year will be kept constant in each round of calculations – i.e. the calculation of the case-based fixed-sum catalogue for 2007 will be based on the 2005 data year.

3.3.2 Revision of Classifications

3.3.2.1 AIDS/HIV

The G-DRG system for 2006 continues to reflect HIV illness and HIV associated afflictions in a separate MDC (MDC 18A *HIV*). Several proposals were received within the scope of the recommendation procedure dealing with the theme of HIV, and were analysed. In addition, several analyses were carried out during this year's update of the G-DRG system. These resulted in the split criterion of the S63 DRG "complex diagnosis" being augmented by a PCCL split. In the S63A DRG *infection in the case of HIV illness with complex diagnosis and extremely difficult CC* cases of HIV-illness with infections that also feature an appropriate degree of difficulty in addition to a complex diagnosis such as tuberculosis of the lung are grouped together. A more concise

demarcation of more involved cases as well as a higher homogeneity coefficient could hereby be achieved.

Furthermore the previously unsplit S65 DRG *other afflictions in the case of HIV illness* has been distinguished on the basis of "heart infarct, chronic ischemic heart disease or extremely difficult CC". This alteration also represents laborious patients in one case group while at the same time improving the homogeneity of the DRGs concerned.

3.3.2.2 Alcohol Intoxication, Misuse and Dependency

In MDC 20 *alcohol and drug use and alcohol and drug induced psychological disorders* a comprehensive reorganisation has been undertaken. Through the recommendation procedure for 2006 it has once again been indicated that a "qualified detoxification" in a specialist clinic is not appropriately reflected in the DRGs for alcohol intoxication, detoxification and alcohol misuse and dependency. Since no OPS code existed yet for a "qualified detoxification" comprehensive analyses of appropriate cases was carried out, during which they displayed a significantly difference in cost and length of stay have therefore been reflected in case groups of their own.

The following basis DRGs were thereby affected:

- V60 *alcohol intoxication and detoxification*
- V62 *disorders due to alcohol misuse and alcohol dependency*

Parallel to this, the code 8-985 Motivation treatment of a sufferer from dependency [qualified detoxification] was established in the OPS for 2006. The two DRGs, V60A *alcohol intoxication and detoxification with psychotic syndrome or with qualified detoxification* and V62A *disorders due to alcohol misuse and alcohol dependency with qualified detoxification* can be accessed in future by using these OPS keys.

Furthermore, criticism was voiced in the recommendation procedure that DRG V60C (G-DRG system 2005) was addressed in all cases relating to infants and youngsters even in cases of serious disorders. Several proposals were submitted for grouping patients treated for alcohol intoxication with detoxification syndrome in a DRG of their own. Patients being treated for acute intoxication without detoxification syndrome should also be grouped separately in a DRG of their own.

In the context of analysis undertaken, the proposed parameter was confirmed to be a better cost differentiator in the basis V60 DRG than the previous parameter (age and length of stay). Therefore, in this matter too, the stimuli from the recommendation procedure in could also be put into practice.

The following overview (table 11) presents a comparison of the altered DRG definitions in the area of alcohol intoxication, misuse and dependency of the 2006 DRG system with the definitions of the 2005 system:

G-DRG-System Version 2005	G-DRG-System Version 2006
V60A *alcohol intoxication and detoxification, length of stay more than one day or age >17 years with*	**V60A** *alcohol intoxication and detoxification with psychotic syndrome or with qualified*

extremely difficult or difficult CC	*detoxification*
V60B *alcohol intoxication and detoxification, length of stay more than one day or age >17 years, without extremely difficult or difficult CC*	**V60B** *alcohol intoxication and detoxification without psychotic syndrome, without qualified detoxification, with detoxification syndrome*
V60C *alcohol intoxication and detoxification, age <18 years, length of stay one day*	**V60C** *alcohol intoxication and detoxification without psychotic syndrome, without qualified detoxification, without detoxification syndrome*
V62Z *disorders due to alcohol misuse and alcohol dependency*	**V62A** *disorders due to alcohol misuse and alcohol dependency with qualified detoxification*
	V62B *disorders due to alcohol misuse and alcohol dependency without qualified detoxification*

Table 11: DRGs for alcohol intoxication, misuse and dependency

3.3.2.3 Ophthalmology

The emphasis of proposals received for MDC 02 *illnesses and disorders of the eye* in the recommendation procedure lay with combined intervention (extra capsular cataract extraction [ECCE] in combination with other operations, ambilateral operations) as well as the restructuring of operations on the ocular muscle and the reflection of radiotherapy in this MDC.

Up to now, operations on the ocular muscle were split between DRG C10Z *operations on the ocular muscle, age <7 years or complex operations on the ocular muscle* and DRG C21Z *operations on the ocular muscle, age >6 years*. Numerous new codes for combination operations on the ocular muscle were incorporated into the 2004 version of the OPS, which were again augmented in the 2005 version of the OPS. Both the encoding and the definition of DRGs for complex operations on the ocular muscle were thereby simplified.

On the basis of analysis, the case groups for operations on the ocular muscle could be defined anew for the 2006 G-DRG system. The classical corrective surgery for strabismus in infants falls hereunder. Through the rearranging of ocular muscle operations in the new DRGs C10A operations on the ocular muscle with increased complexity and C10B operations on the ocular muscle without increased complexity more laborious cases could be distinguished better than with the previous delineation according to age and complex interventions, and the homogeneity coefficients (C10A: 78%, C10B: 77%) could be further increased. Following the realisation of the improved definition of a more involved intervention, the split criterion *age <7 years* proved no longer to be a significant cost differentiator and was dropped. The realised differentiation takes account – as was already the case in the 2005 G-DRG version – of certain ambilateral operations increasing the level of severity.

Furthermore, the portrayal of the combined intervention “cornea transplantation with extra capsular cataract extraction” was proposed. Analysis of the data at hand showed

significant cost differences between the case groups “cornea transplantation with ECCE” and “cornea transplantation without ECCE” as well as a variance reduction, and so the basis DRG C04 *cornea transplantation* has been split. Proposals for splitting other DRGs according to the ECCE criterion were simulated but could not be implemented due to lack of significant cost variations.

The recommendation procedure also indicated that cases in the MDC 02 with malignant tumour and radiotherapy were not yet specifically reflected. The respective OPS codes have been allocated to the DRG C02A enucleations and operations on the orbita in the case of malignant tumour and radiotherapy in the case of malignant tumour. An appropriate reflection of these cases could thereby be achieved.

3.3.2.4 Special Areas of Treatment

Information was also received in this year’s recommendation procedure regarding highly specialised subject areas previously not appropriately reflected in the D-DRG system which effect special areas of treatment. Analyses of numerous themes were undertaken, e.g. the themes of rheumatological and naturopathic complex treatments.

Rheumatological Complex Treatment

The establishing of a new DRG for rheumatological complex treatment is an important point in the G-DRG system update for 2006. A specific applicable attribute for defining rheumatological complex treatment has been lacking up to now; nevertheless, it was possible to examine this subject area with comprehensive analyses. As a result, an independent DRG I97Z *rheumatological complex treatment in the case of illnesses and disorders of the musco-skeletal system and connective tissue* has been defined. A specific identifier is provided for future calculation from the 2005 data year onwards by the code *multi-modal rheumatological complex treatment*.

Naturopathic Complex Treatment

The relevant OPS code for naturopathic complex treatment is an optional key of the 2004 version of OPS-301. Analyses of data provided by specialist clinics within the scope of the provision of augmentative data showed that the provision of naturopathic complex treatment is spread over various MDCs. What’s more, these services have been defined as ZE2006-40 naturopathic complex treatment since the other criteria for establishing a supplementary remuneration were also present. However, an evaluation of this supplementary remuneration was not possible on the basis of the data at hand. The code 8-975.2* naturopathic complex treatment is available, which should provide a more extensive data base for next year’s calculation.

3.3.2.5 CCL Matrix

Many proposals were also submitted within the framework of the recommendation procedure for 2006 concerning changes to the PCCL system. The spectrum of the proposals’ content primarily covered the incorporation of over 3,000 individual codes into the CCL matrix, the deletion of CCL values for certain diagnoses, the upgrading or downgrading of existing CCL values, the deletion of CCL values for only a few case constellations and the linking of the CCL value of diagnoses to certain procedures.

As was already the case last year, the “sponsor concept” was applied for the line allocation as well for determining entries in the exclusions list. In this, the line allocation as well as the exclusions of the diagnosis to be newly assigned is adopted from a related diagnosis that is already incorporated in the CCL system.

Only a few of the proposals received specified comparative codes for a specific diagnosis to which a CCL value should be allocated, in part only a CCL-value span was specified to which a diagnosis should be allocated, or merely the fact that a specific diagnosis should be evaluated with a CCL value.

Each individual alteration to the CCL matrix or exclusions list can result in a change in the grouping of all PCCL-split DRGs. Accordingly, the effect of every individual change on the system as a whole is immense. On the other hand, no methodology exists at present to evaluate these far-reaching changes that occur with each modification of the CCL matrix.

As was the case the previous year, the incorporation of all proposed codes into the CCL matrix would have let to a debasement of the PCCL value as a split criterion. The PCCL values of individual cases would generally rise. This in turn would reduce the probability of finding higher PCCL values as cost differentiators.

For this reason, only blatant inconsistencies have been corrected in this year’s update of the G-DRG system. This means the inclusion of specific diagnosis keys in the CCL matrix where unspecific codes were already an integral part of the matrix. For example, codes from S72.4 *distal fracture of the femur* have been included since the unspecific code S72.8 *Fractures of other parts of the femur* was already to be found in the CCL-Matrix. Also incorporated into the CCL matrix was, for example, the code U80.0! *staphylococcus aureus with resistance to Oxacillin, glycopeptide antibiotics, quinolones, streptogramins and oxazolidinones,* for which the code B95.6! *staphylococcus aureus as the cause of illnesses classified in other chapters* took on the role of “sponsor”. In the end, 180 diagnoses were newly incorporated in the CCL matrix and 9 codes were deleted from the matrix, including, for example, the code F17.2 *psychological and behavioural disorder caused by tobacco, dependency syndrome.*

Following the reduction in the number of PCCL-split DRGs from 441 to 358 as a result of the previous year’s update of the G-DRG system, all DRGs were this year examined anew for possible PCCL splits. A total of 9 new splits could thereby be established, which gives a total number of 367 PCCL-split DRGs for 2006. Speculation over the possible reasons for this increase in PCCL splits cites, for one thing, a better quality of encoding since many establishments had already carried out „DRG-oriented“ codification in 2004 and, for another, the cover effect could be less pronounced in the calculation due to an altered hospital-mix.

3.3.2.6 Dermatology and Mammary Diseases

The optimisation of the representation of MDC 09 *illnesses and disorders of the skin, subcutis and mamma,* and surgical dermatology in particular, was the central theme of several suggestions of the recommendation procedure for 2006. In particular the optimal representation of multiple interventions and the improved representation of procedures that increase the complexity involved were core themes in this area. Some of the proposals could be accepted following an analysis of these themes. For

example, cases of covering soft tissue have been enhanced within the basis DRG J22 and in future will be grouped together in the DRG J22A *other skin transplantation or debridement without complex intervention, without complex diagnosis, without extremely difficult or difficult CC with covering of soft tissue.* Basis DRG J08 *other skin transplantation or debridement with complex diagnosis, with additional intervention on the head and neck or extremely difficult CC*, is a similar example where it was possible to differentiate cases with complex procedures such as, for example, trepanation or surgery to the floor of the mouth. In addition, further extensive analysis was carried out in the direction shown by the submitted proposals. As a result, it was possible to establish new DRGs by designating procedures that increase the complexity involved. The attributes available for analysis were not everywhere so resilient that they allowed an improved representation to be achieved. However, it was partially possible to improve the representation with the help of PCCL splits.

On the basis of separate analysis, an improvement of the entire system has arisen from the restructuring of the basis DRG J11 *other operations on the skin, subcutis and mamma*. As a result, the three degrees of difficulty that existed in the 2005 version of the G-DRG system have been abandoned in favour of a differentiation on the basis of moderately difficult procedures.

In the case of the basis DRGs J13 *small operations on the mamma except in the case of malignant tumour* and J15 *major operations on the mamma except in the case of malignant tumour* it was possible to cleanse the initial conditions of the main diagnoses of malignant tumours which, according to the polling sequence of MDC 09, have already been polled beforehand in the DRGs J07Z *small operations on the mama with axillary lymph node excision or extremely difficult or difficult CC in the case of malignant tumour* and J23Z *major operations on the mamma in the case of malignant tumour*.

It was possible to further improve the preceding year's already good homogeneity coefficient of over 65% especially in the surgical DRGs, so that in some case homogeneity coefficients of over 70% (J06, J14) could be achieved this year.

3.3.2.7 Dialysis Procedure

The representation of patients admitted for treatment of kidney failure or specifically for dialysis has changed in the 2006 version of the G-DRG system in several points. These patients are still allocated to the basis DRGs L60 *kidney insufficiency, length of stay more than one day, inpatient admission for dialysis* and L71 *Kidney insufficiency, length of stay one day*, amongst others; however, it has been possible to define two new DRGs – L90A *kidney insufficiency, day-patient, age <15 years* and L90B *kidney insufficiency, day-patient, age >14 years* – to reflect day-patient treatment of kidney insufficiency.

From the basis DRG L60, It was possible to differentiate cases with thrombotic microangiopathy (L72A *thrombotic microangiopathy)* that were still grouped in the MDC 05 in the 2005 version of the G-DRG system, as well as cases with haemolytic uraemic syndrome (L72B *haemolytic uraemic syndrome*), since these cases were associated with significantly higher costs.

It was already possible according to the case-based fixed-sum catalogue of 2005 to settle supplementary remunerations for dialysis treatment of cases not grouped in the basis DRGs L60, L61 and L71. The supplementary remuneration for *haemodiafiltration,*

intermittent evaluated in 2005*,* is designated as an unevaluated supplementary remuneration for 2006. By contrast, it was possible to evaluate the supplementary remunerations for *extracorporeal photopheresis* and *plasmapheresis*.

3.3.2.8 Epilepsy

As was already the case in the development of the G-DRG classification for 2005, the representation of highly specialised treatment in cases of complex epilepsy has been analysed and improved for 2006. Thereby, the grouping in the DRG B76A *seizures, length of stay more than 1 day, with complex diagnostics and therapy* has been made independent from the main diagnosis by polling the *OPS* code 1-213 *syndrome diagnosis in cases of complex epilepsies* without a diagnostic precondition, to avoid cases being classified in another DRG despite complex diagnostics having been carried out already.

Furthermore, the DRG B76A *seizures, length of stay more than 1 day, with complex diagnostics and therapy* is now polled before DRG B46Z *socio- and neuropaediatric therapy in the case of illnesses and disorders of the nervous system* to reflect highly complex infant epilepsy patients better in the G-DRG system.

The DRGs of the highly specialised service areas of epilepsy that were newly defined the previous year remain; however, no cost weight has been identified for several DRGs in these areas. The services that for the time being cannot be covered by fixed sums therefore remain separated from those that can be covered by fixed-sums.

The proposal to establish DRGs covering complex epileptological diagnostics in other MDCs could not be implemented due to too few cases in the calculation hospital data.

3.3.2.9 Early Rehabilitation

As in previous years, representation of early rehabilitation was an important point in developing the G-DRG system for 2006 and much information on this theme was submitted by hospitals and specialist bodies in the 2006 recommendation procedure.

Since it was not yet possible in 2004 to differentiate on the basis of OPS codes between *neurological-neurosurgical early rehabilitation* (8-552.-) and *other early rehabilitation* (8-559.-), an augmentative compilation of data on this theme was undertaken this year as well, which made a keener analysis of “neurological-neurosurgical early rehabilitation” in the MDC 01 *illnesses and disorders of the nervous system* possible.

Early rehabilitation was removed as a split criterion from the DRG B02, by condensing the existing DRGs B02A *craniotomy or complex spinal OP with extremely difficult CC or artificial respiration >95 hours, with early rehabilitation,* B02C *craniotomy or complex spinal operation without extremely difficult CC, without artificial respiration >95 hours, with early rehabilitation* and B11Z *early rehabilitation with specific OR procedure in the case of illnesses and disorders of the nervous system* into the new, unevaluated DRG B11Z *early rehabilitation with craniotomy, major spinal OP, specific OR procedure or involved operation on the nervous system with artificial respiration >95 hours*, which is now polled before the basis DRG B02.

In addition, cases with early rehabilitation of between 14 and 17 days of treatment are now reflected in the DRG B43Z, when they feature a period of artificial respiration greater than 95 hours.

It was possible on the basis of the augmentative data compilation to establish the DRGs F29Z *early rehabilitation in the case of illnesses and disorders of the circulatory system, with specific OR procedure, except for cardiothoracic interventions* and I96Z *early rehabilitation with specific OR procedure in the case of illnesses and disorders of the musco-skeletal system and connective tissue, more than 20 days* in the MDC 05 *illnesses and disorders of the circulatory system* and the MDC 08 *illnesses and disorders of the musco-skeletal system and connective tissue*, since these cases showed themselves to differ in cost and length of stay compared with the existing case group allocation. In addition to early rehabilitation, these DRGs are also defined by the function “specific OR procedures”.

No cost weight is featured for several DRGs in this area. The services that for the time being cannot be covered by fixed sums therefore remain separated from those that can be covered by fixed-sums. An evaluation has not been successful because the data available on the basis of the augmentative data compilation for this very special area has proved to be irregular. Further proposal simulation and analysis of our own led, on the basis of the data at hand, to no system changes, also in the case of other than the proposed MDCs already mentioned.

With the continuing buoyant participation in the recommendation procedure for 2006, additional possibilities for analysis exist for the G-DRG system update for 2007 due the wider data base of 2005, in which the OPS codes *neurological-neurosurgical early rehabilitation* (8-552.-) and *other early rehabilitation* (8-559.-) are already being applied as standard.

3.3.2.10 Gastroenterology / Endoscopy

Numerous proposals for developing the G-DRG system in the area of gastroenterology have again been received in this year’s recommendation procedure, too.

An ongoing problem, as was the case last year, has been posed by “inferior levels of reimbursement in the case of multiple services“. Much information has been presented, not only in the recommendation procedure for 2006, that additional measures of treatment can lead to case devaluation. This can often happen in MDC 06 *illnesses and disorders of the digestive organs* when operative intervention is carried out. To take account of this situation, a sortation spanning sections was carried out in the MDC 06 as already suggested last year. Affected by this were the DRGs of the other and medical sections. Further details can be found in ch. 3.3.3.3.

The result of this analysis is, to give an example, the polling of the DRG G70A *other serious illnesses of the digestive organs with extremely difficult CC* (cost weight: 1.296) from the medical section before the DRG G50Z *gastroscopy in the case of non-serious illnesses of the digestive organs, with extremely difficult or difficult CC* (cost weight: 0.722) which can be found in the other section. This avoids an inferior reimbursement of cases that were previously allocated to DRG G50Z on the basis of a performed gastroscopy.

The 2005 G-DRG system DRGs G54Z *coloscopy, length of stay more than 2 days, without extremely difficult or difficult CC, without complicating intervention,* and G55Z

gastroscopy in the case of non-serious illnesses of the digestive organs, length of stay more than 2 day, without extremely difficult CC are dispensable in the sort sequence since endoscopic service is no longer a cost differentiator.

The dissolution of the DRG G49Z *coloscopy and gastroscopy, length of stay less than 3 days* was due to a similar difficulty, for there was an under-reimbursement in the case of multiple services here, too. The incentive for endoscope encoding was dependent on the length of stay (1, 2, 3 days).

The definitions that have existed up until now for the basis DRG G09 *ambilateral interventions in the case of groin and femoral hernias, age >55 years* and the DRG G24Z *operations in the case of abdominal hernias, umbilical hernias and other hernias, age >0 years or ambilateral interventions in the case of groin and femoral hernias, age >0 years and <56 years or interventions in the case of groin and femoral hernias, age >55 years* have been expanded to such an extend that case where various hernia operations are carried out in one session can now also be represented.

To achieve a more outlay-equitable reflection of operations in the case of anal atresia in newborn infants, the movement of the respective code into various DRGs was analysed. In the end, the movement of the code into DRG G17Z *other rectum resection* proved to provide the best solution. This means a decidedly higher evaluation of anorectal malformation in comparison with last year's system.

3.3.2.11 Obstetrics

The essential points of the recommendation procedure for 2006 in the field of obstetrics dealt with problem areas already known from the previous year. These were for example:

- the modification of MDC 14 *pregnancy, birth and confinement* on the Australian model
- the reflection of the length of prepatral stay with the code 9-280 *inpatient treatment prior to delivery during the same stay* of OPS 2005
- the reflection of foetal surgical interventions within MDC 14

The G-DRG system differentiates between "delivery DRGs" such as the basis DRGs O01 *caesarean section*, O02 *vaginal delivery with complicating OR procedure* and O60 *vaginal delivery* from "non-delivery DRGs" such as e.g. O64 *ineffectual labour pains*. It was pointed out in regard to the grouping of births that a small proportion is allocated to non-delivery DRGs instead of to the delivery DRGs intended for them. On the other hand, cases have also been reflected in delivery DRGs in which no delivery took place. It was therefore suggested that MDC 14 be remodelled on the Australian model, which provides for allocation to the basis DRGs O02 and O60 solely on the basis of diagnoses from the areas O80 – O82 *delivery* and Z37.-! *result of delivery*.

This could not yet be fully realised in this year's update of the G-DRG system. However, the existing definitions of the basis DRGs O02 and O60 have been so extended that cases with delivery can now actually be allocated to these case groups on the basis of code Z37.-!, which has resulted in an improvement of the system as a whole. Parallel to this, the application of diagnoses from Z37.-! have been specified in the German Encoding Guidelines (DKR 1507e).

By contrast, analysis of cleansing the delivery DRGs of „non-births“ yielded such inconsistent results that it was impossible to implement it as apart of this year’s revision. A renewed examination of this subject area is envisaged for the G-DRG system update for the year 2007.

We had already received information regarding the length of prepartal stays as possible cost differentiators in delivery DRGs. Since, at the time, auxiliary analysis of simulations carried out concerning this problem bore no results, the inclusion of a relevant OP code in OPS version 2005 was initiated. However, this OPS code was not yet available in calculation hospital data for this year, which is why auxiliary analyses of admission, operation, and discharge data has once again been carried out. In the process, code O09.-! *length of pregnancy* has proved to be a better cost differentiator, so that in the end a differentiation of delivery DRGs has resulted on the basis of diagnoses from O09.-! *length of pregnancy,* which has led to a subdivision of the basis DRG O01 into five levels of intricacy, the basis DRG O02 into two and the basis DRG O60 into four. A much more differentiated definition of the delivery DRGs was thereby possible, by which highly involved cases could be separated from less involved cases.

The performance of foetal surgical interventions was reflected for the first in DRG O65A *other prenatal inpatient admission with intrauterine therapy of the foetus*. At the same time, the procedures for intrauterine foetal therapy and other intrauterine operations on the foetus have been further differentiated in OPS version 2006, so that further calculations will be possible in the coming years.

On the basis of our own investigations of the remaining DRGs of MDC 14 for possible cost differentiators, it was possible to upwardly revaluate cases with cerclage or cervical occlusion in the basis DRG O05 *specific OR procedures in pregnancy*. Analysis regarding a better reflection of complications during pregnancy and childbirth bore no results.

3.3.2.12 Geriatrics

The DRGs of geriatric early-rehabilitative complex treatment, which were first included in the G-DRG system in 2004 and delimited from early rehabilitation in 2005 (with the exception of in DRG K01A), were examined in this year’s update for possibilities of a further differentiation. The most varied proposals were submitted on this theme, affecting almost all MDCs.

An augmentative data survey in the calculation hospitals was also undertaken concerning geriatric early rehabilitative complex treatment due to the changes in the service definition of this area’s OPS code. The analyses of geriatric early rehabilitative complex treatment were therefore based on the substantiated additional data provided. However, it was not possible to establish either a split of the examined DRGs using OPS code 8-550.2 *geriatric early rehabilitative complex treatment, length of treatment at least 21 days and 30 units of therapy, or a new DRG in the respective MDCs on the basis of OPS code* 8-550.0 *geriatric early rehabilitative complex treatment, length of treatment at least 7 days and 10 units of therapy*, since either too few cases were present or the results proved to be non-uniform. Grouping in a DRG defined using geriatric early rehabilitative complex treatment is therefore still only possible by using OPS codes 8-550.1 and 8-550.2. These require a length of treatment of at least 14 days and 20 units of therapy.

Numerous concrete recommendations were also made for establishing geriatric early rehabilitative complex treatment in conjunction with surgical or urological interventions. However, it was not possible to establish DRGs for concurrent geriatric early rehabilitative complex treatment in conjunction with surgical wound cleansing or special procedures such as cardio surgical, vascular surgical, mammary surgical or urological interventions or in connection with multi resistant pathogens, since the simulations carried out could not be evaluated due to low case numbers.

A split on the basis of the Barthel-Index ≤35 points (ICD codes U50.- and U51.-) and the motorical FIM [Functional Independence Measure] of 13–42 points led to a good cost separation in the basis DRG B44 *geriatric early rehabilitative complex treatment in the case of illnesses and disorders of the nervous system*. Furthermore, this feature was adopted as an entrance criterion for the basis DRG B44. No improvement through a differentiation on the basis of the Barthel-Index resulted for the other geriatric early rehabilitative complex treatment DRGs examined.

Further system improvements were not possible on the basis of the augmentative data compilation, since it was either impossible to simulate the suggested constellations due to an under-representation in the control sample, or the results were either contradictory or irregular due to low case numbers. However, the improvements in representing geriatric patients through the changes implemented in ICD-10-GM allow for a more differentiated analysis of geriatric cases next year.

3.3.2.13 ENT

Numerous suggestions for reorganising the operative DRGs in MDC 03 illnesses and disorders of the ear, nose, mouth and throat were received in this years recommendation procedure. A large number of these suggestions couls be implemented. It was suggested that operative interventions on the nose and the paranasal sinuses that were spread over various DRGs in the 2005 version of the DRG system should be reflected in DRGs of their own; it has been possible to implement this almost completely. The similarly suggested reorganisation of operative interventions on the ear and mastoid by consolidating cases with the relevant procedures led by contrast to no improvement in the system.

It was also possible to implement suggestions of code inclusion and adjustment for combined fractures on the jaw bone, supradental ridge and vestibulum plasty, the repositioning of facial fractures, free microvascular transplants, the removal and transplantation of muscles, tendons and fasciae, flap-plasty and free skin transplantations and midface osteomies, as well as improve the reflection of diagnoses in the area of hearing loss and limited hearing. It was possible to achieve a homogenous reflection in MDC 03 of cases with a variety of involved procedures.

The changes made by DIMDI in ENT chapters 5-19, 5-20 and 5-21 of the OPS for 2006 do not yet permit simulation in this year's update of the G-DRG system due to the lack of a service identifier and will first become the basis of analysis in the coming calculation.

3.3.2.14 Intensive Care Medicine

Extensive changes in the area of intensive care medicine have already been implemented in the scope of the 2004 calculation. The most important modifications of the G-DRG system were at the time:

- the differentiation of artificial respiration DRGs in the pre-MDC by using the attributes “operative intervention” (staggered according to degree of complexity), “polytrauma” and “intensive-care-medicine-relevant procedures“ and
- the establishment of the function “complicating procedures” as a significant cost differentiator outside artificial respiration DRGs as well.

Both modifications have proven their worth in this year’s calculation and have been adopted – following numerous analyses – in a slightly modified form in the 2006 version of G-DRG.

It has been possible to achieve considerable progress in the appropriate reflection of intensive care medicine services by the inclusion for the first time of intensive care medicine complex treatment in the G-DRG classification.

Intensive Care Medicine Complex Treatment

With code 8-980 *intensive care medicine complex treatment* a new attribute for defining highly involved intensive care therapy has been adopted by OPS version 2005. The definition of this code is closely modelled on suggestions made by the specialist bodies concerned and takes account of a large number of important parameters in intensive care medicine:

- involved intensive care medicine services such as invasive monitoring procedures, administration of catecholamine or high-dosage infusion therapy (the international *therapeutic intervention scoring system* or ***TISS** is used*)
- significant clinical and laboratory chemical parameters of the patient, e.g. heart rate, kidney function and potassium level (the *simplified acute physiology score* or ***SAPS II*** is used here)
- specific chronic illnesses that make intensive care therapy significantly more difficult (malignant tumours, AIDS)
- age of the patient
- admission status (planned admission or emergency)

Once a day a points’ value (0 to a maximum of 184) is ascertained from these elements, the daily points’ values of the entire stay are added together so that only one OPS code *intensive care medicine complex treatment* is then encoded. This consequently quantifies the total extent of the respective case of intensive care medicine.

Calculation data would have been available for a service evaluation in 2006 at the earliest since it was possible to encode this service for the first time in 2005. However, due to the outstanding significance of this theme, an attempt to achieve an improvement in the reflection of intensive care medicine already for the G-DRG system version 2006 was made with the help of this new attribute.

More than 30,000 cases from 33 clinics with data concerning intensive care medicine complex treatment were transmitted to InEK as part of the provision of augmentative

data, a large proportion of them with an exact points' value. The pleasing wide-scale participation in the provision of augmentative data is in itself a great success considering the necessary time and effort it entails in the clinics (in parts, a complete re-registering of the data).

As a result, it has been possible, thanks to the additional case attribute, to further differentiate the artificial respiration DRGs A06, A07, A11 and A13 on the one hand, and on the other, to calculate 3 new DRGs for involved intensive care therapy in cases without artificial respiration >96 hours.

These DRGs

F97Z *intensive care medicine complex treatment >1104 points in the case of illnesses and disorders of the circulatory system with specific OR procedures* with a cost weight of 11.808

G36Z *intensive care medicine complex treatment in cases of illnesses and disorders of the digestive organs, >1104 points* (cost weight 13.337)

W36Z *intensive care medicine complex treatment >1104 points in the case of polytrauma* (cost weight 17.156)

Accommodate highly involved operative or (with the exception of DRG F97Z) conservative treatment cases that until now, due to the missing attribute artificial respiration >96 hours, have not been allocated to the highly evaluated artificial respiration DRGs of the pre-MDC, but to a "non-intensive care DRG" of the respective MDC and were there under-financed. The cases concerned were, as a rule, longliers in their original DRGs.

These DRGs have all been defined with a high access threshold. 1105 points in the case of intensive care medicine complex treatment are the equivalent of a patient of a 10–14-day maximal intensive care treatment. In the light of this, an appreciable upcoding appears hardly possible.

Further Differentiation of Artificial Respiration DRGs

The length of artificial respiration has again proven to be the best cost differentiator as a primary criterion for allocation to DRGs A06 to A13. IT has been possible to establish intensive care medicine complex treatment as a further split criterion in four of these five DRGs in addition to the split criteria (operations, polytrauma) introduced in G-DRG 2005. Especially involved cases with a high number of points are thereby allocated to the DRGs with the highest revenue of the respective basis DRG, whereby a high access threshold is also applied. According to DRG, a lower limit of between 1105 up to as many as 3681 points is necessary.

IT is also new that an age split has been introduced in three DRGs (A06, A09, A13), which results in a better reimbursement of intensive care patients younger than 16 years of age.

Function Complicating Procedures

Several requests have been made in the recommendation procedure for altering this split criterion introduced last year, ranging from additions to the deletion of codes from this function that is effective increasing the order of severity in several MDCs. Numerous analyses have shown no positive effect accruing from such changes. However, the establishment of a new logic for this function that now requires "two separate procedures" instead of the previous "two procedures" has proven to be an improvement. For example, cases that bear – contrary to encoding guidelines – the

procedure “treatment for lying position”, no longer fulfil the conditions of this function according to G-DRG 2006.

This function has proven itself to be a “resilient” split criterion in this year’s calculation. This is also born out by the further increase in the number of split DRGs. For example, the function has new grouping relevance in MDC 08 *illnesses and disorders of the musco-skeletal system and connect tissues* and in MDC 21A *polytrauma*.

Additional Financing Elements

This year’s calculation has once again showed that some of the supplementary remunerations already listed in the 2005 case-based fixed-sum catalogue – for blood products or dialysis procedures, for example – are of considerable significance for the appropriate reflection of intensive care medicine. The changes in supplementary remunerations are explained at length in chapter 3.4.1.3.

Further Possibilities for Development

The shortening of the so-called OPS calculation gap by the provision of augmentative data concerning intensive care medicine complex treatment has proven to be very successful. It is to be expected, however, that the possibilities for analysis and realisation in the field of intensive care medicine will increase considerably further when this information is available for the whole of the calculation data as well as the DRG data as per para. 21 KHEntgG in 2006. In addition, the new codes for blood products and extremely expensive medicines also introduced in 2005 promise further insight gains for next year’s calculation.

As it was already apparent this year that the expense categories of the code *intensive care medicine complex treatment* had been selected somewhat broadly, OPS version 2006 has been further differentiated in this respect.

3.3.2.15 *Paediatric Cardiology and Paediatric Surgery*

Children with heart illness are further reflected in two different MDCs in the 2006 version of the G-DRG system. All cases aged under 28 days and cases aged under one year with an admission weight under 2,500 grams are allocated to MDC 15 *newborn infants*, other cases usually to MDC 05 *illnesses and disorders of the circulatory system*.

As in last year, on the basis of information provided in the recommendation procedure, and beyond it, intensive analysis has been carried out to identify cost differences between adults and children, which has led to changes in this field. Age has been introduced as a cost differentiator in two further DRGs: F75B *other illnesses of the circulatory system without extremely difficult CC or decubitus, age <18 years* and F49D *invasive diagnostic cardiology except in the case of acute myocardial infarction, less length of stay less than 3 days, age <15 years.* The number of DRGs in MDC 05 illnesses and disorders of the circulatory system has risen again in comparison to G-DRG version 2005 to seven.

Changes in MDC 15 Newborn Infant

Last year, the existing split according to *serious problems* in the basis DRG P02 *cardiothoracic or vascular interventions in the case of a newborn infant* was replaced by a split on the basis of length of artificial respiration. Length of artificial respiration

further proved in this year's analyses to be the best cost differentiator in this DRG. The procedure table of the basis DRG P02 has nevertheless been expanded to cover various vascular interventions. Further explanatory details concerning MDC 15 can be found in chapter 3.3.2.28.

3.3.2.16 Illnesses and Disorders of the Circulatory System

Acute Coronary Syndrome

It was proposed in the recommendation procedure that all cases with an acute coronary syndrome (heart attack, instable angina pectoris) be reflected in one basis DRG that should be split according to:

- coronary intervention with/without stent implantation
- invasive diagnostics using heart catheter
- hospital equipment (presence of a heart catheter laboratory)
- transferral status and transferral point in time
- treatment on an intensive care ward

A similar suggestion also included in this classification the services

- the administration of glycoprotein(GP)-IIb/IIIa receptor antagonists and
- systemic thrombolysis.

These recommendations have been calculated in numerous variations, but could not be realised in the form suggested. For one thing, the joint representation of patient with acute coronary syndrome in one basis DRG as opposed to the present case group definition would have lessened the differentiation. For another, the data basis for several of the suggested attributes was insufficient. The necessary service identifiers in the calculation hospital data were lacking (GP-IIb/IIIa receptor antagonists) or were only listed for a few cases (systemic thrombolysis). Detailed analyses of the representation of transferred patients revealed nothing conspicuous.

The highly differentiated representation of both coronary interventions and invasive diagnostic cardiology that already exists in the G-DRG system has been further improved for 2006.

Interventional Cardiology

Extensive analyses in the area of interventional cardiology have again been carried out this year, thoroughly examining cases with combined interventions in particular. This has resulted, for example, in patients on whom both a percutaneous transluminal coronary angioplasty (PTCA) and a percutaneous transluminal angioplasty of the peripheral arteries (PTA) have been performed being grouped in the basis DRG F24 *implantation of a heart pacemaker, bi-ventricular or percutaneous coronary angioplasty with complex diagnosis and highly complex intervention or with percutaneous angioplasty* in G-DRG system 2006, which amounts to an upward revaluated of cases with this intervention combination.

Cases in which an intracoronary brachytherapy has been performed have also been significantly enhanced in G-DRG-System 2006 by their reflection in DRG F52B

percutaneous coronary angioplasty with complex diagnosis, without extremely difficult CC or with intracoronary brachytherapy.

The diagnostic procedure endosonography of the blood vessels has also been enhanced. From 2006 onwards, it is evaluated in the basis DRG F49 as a *complex procedure* and thereby leads in DRG *F49A invasive diagnostic cardiology except in the case of acute myocardial infarction, more than 2 days of occupancy, with complex procedure*.

The implantation of multiple stents (coated or uncoated) already led in G-DRG system 2005 to grouping in a higher evaluated DRG; except in the case of a combination of a coated and an uncoated stent, which has now be appropriately corrected in G-DRG version 2006.

Further changes in the area of interventional cardiology were:

- new DRG for interventional closure of an artrial and ventricular septal defect DRG
- new DRG for intracoronary stem cell therapy (unevaluated)
- new DRG for invasive diagnostic cardiology in the case of children under 15 years

Heart and Artery Surgery

An extensive reorganisation in the area of Heart and Artery Surgery was already undertaken for the 2004 and 2005 G-DRG-System. For example, the DRGs for heart valve and bypass surgery have been extensively split.

Suggestions have been made regarding this differentiation, that further procedures should be considered here in increasing order of difficulty, for example the implantation of a heart pacemaker during the same inpatient stay or the performance of intraoperative ablative measures. It has not been possible to realise these recommendations since calculations on the basis of the data from the calculation hospitals showed no improvement in the system as a whole. An enhancement of specific operations in heart valve surgery (anuloplasty) has however, been realised.

Only moderate changes have therefore resulted in heart and artery surgery for 2006

Other Changes in the Area of Illnesses and Disorders of the Circulatory system

DRG *F97Z intensive care medicine complex treatment >1104 points in the case of illnesses and disorders of the circulatory system with specific OR procedure* has been established. The cases of this new DRG were spread over various DRGs in the operative section in the 2005 G-DRG version, and have now, in part, been considerably enhanced. The definition of this DRG is explained separately in chapter 3.3.2.14.

The analysis of last year showed that particularly in cases of endocarditis where a heart catheter examination was additionally performed a considerably lowered level of revenue resulted. Therefore, in the 2005 G-DRG system, differentiations were made in DRGs with interventional diagnostics on the basis of an increasing order of severity´. This year, an extensive analysis of cases with endocarditis without an interventional operation has been carried to examine various points for their suitability as cost differentiators. Here the analysis detected secondary diagnoses that increase the order of severity, so that from 2006 basis DRG F61 *infectious endocarditis* from 2006

onwards is further split on the basis of complicating secondary diagnoses (e.g. osteomyelitis, intracerebral haemorrhaging).

Contrary to MDC15, both adults and children more than 28 day old are reflected in MDC 05 as long as their weight on admission exceeds 2,500 grams. (For age split see chapter 3.3.2.15). Besides age, the PCCL-value also proved to be a good cost differentiator in several DRGs, so that new splits were undertaken in eight DRGs on the basis of the attribute “difficult CC” or “extremely difficult CC”.

3.3.2.17 Treatment of MS

This year we have received on a few recommendations for the 2006 update on the theme of multiple sclerosis. No implementable result in this subject area was provided by the analyses; therefore no changes have been made to the G-DRG system. The differentiation of the code group G35 multiple sclerosis implemented in ICD-10-GM Version 2005 will enable more differentiated analyses to be undertaken when updating the G-DRG system for 2007.

3.3.2.18 Multi-resistant Pathogens

The codes for the specific encoding of multi-resistant pathogens that have been included in ICD-10-GM since the 2004 version were also available for this year’s update of the G-DRG system. Nevertheless, computations on numerous sections of the DRG system that took the ICD codes for multi-resistant pathogens into particular account had no effect on system modification since these have proved not to be a factor in cost differentiation.

However, congruent to codes from B95-97 *bacteria, viruses and other infection pathogens as the cause of illnesses that are classified in other chapters,* the codes U80.0! *staphylococcus aureus with resistance to Oxacillin, glycopeptide antibiotics, quinolones, streptogramins or oxazolidinones (MRSA)* and U80.1! *Streptococcus pneumoniae with resistance to Penicillin, Oxacillin, macrolide antibiotics, oxazolidinones or streptogramins* have been added to the CCL-Matrix. Thereby, these codes can now also operate in descending order of severity.

For the year 2006, a new OPS code 8-987.- *complex treatment in the case of colonisation or infection with multi-resistant pathogens [MRE]; complex treatment in a special isolation unit* has been created for future detailed examination of the problem of multi-resistant pathogens, that has for long been raised.

3.3.2.19 Oncology

The update for 2006 has continued along the path of a differentiated reflection of services for the care of oncological patients already trod last year.

The differentiated representation of chemotherapy constitutes one of the most important points of the update for 2006. The encoding of chemotherapy for the 2004 version of OPS-301 was so differentiated in its form that it was possible for the first

time to distinguish according to complexity in contrast to the previous segregation according to method of application. This enabled the basis DRGs R60 *acute myeloid leukaemia* and R63 *other acute leukaemia* to be split into a total of eleven DRGs for chemotherapy. It has been possible to establish a DRG for *highly complex chemotherapy with operative intervention in the case of haematological and solid tumours* (R16Z) in the operative section of MDC 17 *haematological and solid tumours*. Table 12 presents an overview of the accomplished differentiation in the basis DRGs R60 and R63. It clearly displays the width of cost weights which it was possible to widen considerably (from 1.225 – 5.859 to 1.078 – 9.907). In this, the sortation described below is also relevant.

MDC	Chemotherapy DRGs in DRG-System Version 2005	CW	Chemotherapy DRGs in DRG-System Version 2006	CW
Pre	A42A	4.093	A42A	4.233
17			R16Z	4.327
	R60A	5.859	R60A	9.907
	R60B	5.259	R60B	6.145
	R60C	4.077	R60C	5.744
			R60D	4.535
			R60F	1.967
	R63A	4.144	R63A	7.748
	R63B	3.774	R63B	4.351
	R63C	3.170	R63C	3.860
			R63D	3.224
	R63E	1.225	R63E	2.749
			R63G	1.078

Table 12: DRGs reflecting chemotherapy

For the first time, a section-spanning sortation was carried out, as far as possible, in MDC 17 this year, which means that the DRGs of the operative section and the DRGs of the medical section have been sorted in their polling order algorithm according to descending cost weight. This has largely removed the problem of inferior reimbursement in the case of multiple services by which, for example, a case of chemotherapy that would have been allocated to DRG R63A *other acute leukaemia with chemotherapy, with dialysis or sepsis* of the 2005 version of G-DRG was allocated on the basis of an operative intervention to DRG R11B *lymphoma and leukaemia with specific OR procedure, without extremely difficult or difficult CC or with other OR procedures, with difficult CC* resulting in a significantly lower cost weight than that of

DRG R63A. Further information concerning the sortation can be found in chapter 3.3.3.3.

Possibilities have been sought for simulating last year's changes to the German Encoding Guidelines (DKR 0201d) for cases where patient admission has taken place primarily for the systematic chemotherapy treatment of the primary tumour and/or metastases. It has been possible to identify the case concerned by means of plausibility verification and to re-code them as envisaged in DKR 0201d. Because of this, account could be taken of the change in the encoding guideline in the G-DRG system update for 2006 and the resulting cost weights for the DRGs concerned determined.

The presence of metastases or chemotherapy in the case of solid tumours as a split criterion (for example in the basis DRGs G60, N60) has been examined in a separate analysis. These features have, however, proven themselves not suitable as cost differentiators.

Congruent to systemic chemotherapy, a corresponding provision for cases of systemic radiotherapy (radio iodine therapy, whole-body radiotherapy) has been incorporated in the 2006 German Encoding Guidelines (DKR 0201e). This year's update of the G-DRG system has not resulted in similar comprehensive changes in the reflection of radiotherapy as those already implemented for the 2005 version. Worthy of mention at this stage, however, is the reflection of radiotherapy in the field of ophthalmology that has been newly established this year. A thorough explanation of this subject can be found in chapter 3.3.2.3.

Numerous recommendations have reached us this year again on the subject of creating new supplementary remunerations, and have essentially led to the following changes:

- creation of new supplementary remuneration also for the area of oncology, such as *Cetuximab* (ZE48) and *Liposomal Doxorubicin* (ZE52)
- additional dosage categories for children, the cost balancing of which is limited according to the age of the patient (e.g.<10 years), have been set up for eleven supplementary remunerations, also including non-oncological supplementary remunerations, on the basis of references to the structural under-financing of the oncological treatment of children who receive medicines administered in typical dosages
- creation of an unevaluated supplementary remuneration for *stem cell boost following performed transplantation of haematopoietic stem cells, with in-vitro preparation* (ZE2006-44)
- reflection of *complex diagnostics in the case of haematological and oncological illnesses in children and youngsters* (ZE2006-45)

A thorough explanation of the subject of supplementary remunerations can be found in chapters 2.5 and 3.4.1.3.

3.3.2.20 Parkinson's Syndrome

Since we have received no recommendations for updating the G-DRG system for 2006 in respect of Parkinson's syndrome, no changes have been implemented

The codes for G20 *primary Parkinson's syndrome* that were first split on the basis of degree of severity in ICD-10-GM Version 2006 will continue to allow sufficient analysis.

3.3.2.21 Paraplegia

Following on from the comprehensive consideration paid to the subject of paraplegia during the update of the G-DRG system for 2005, the complex of paraplegia has again been extensively analysed in the update for 2006. DRG B61Z *acute illnesses and injuries of the spinal cord* has been examined with regard to cleansing – as suggested in various recommendations – the code list of varying codes such as those for catheterising in the case of paralysis of the urinary bladder. Neither these analyses nor further suggestions for modifying the system brought any improvement in the system as a whole, so that, finally, no changes have been made to DRG B61Z and the subject area of paraplegia in this year's update.

A certain differentiation between „acute" and „chronic" paraplegia will first be possible in next year's analyses since ICD code G82.- *paraparesis and paraplegia, tetraparesis and tetraplegia* is present in 2005 in a sufficiently differentiated form, thereby providing a satisfactory data basis for the update for 2007.

3.3.2.22 Craniocerebral Trauma

In the course of the recommendation procedure we received information concerning therapeutic hypothermia as a therapy option in the case of craniocerebral trauma. Because no corresponding service identifier was available in OPS 2005 it was not possible to examine whether this therapy could be used as a possible cost differentiator.

As was already the case in the 2005 G-DRG system, DRG A43Z *early rehabilitation in the case of vegetative state and locked-in syndrome* remains unevaluated in 2006 as well. A recommendation that all cases of vegetative state or severe craniocerebral trauma without early rehabilitation be combined in one further unevaluated DRG, could not be realised since the analyses undertaken showed no improvement to the system as a whole.

The allocation of injuries to MDC 21A *polytrauma* was also examined intensely. As a result, two diagnosis codes for unspecific head injuries could be deleted from the definition logic for polytrauma, enabling the definition of polytrauma within the G-DRG systems to be rendered more precise.

3.3.2.23 Stroke

A code for the neurological complex treatment of acute cases of stroke has been introduced into OPS version 2005 to enable a better reflection and analysis of the specialised care of stroke patients. An extensive augmentative collection of data has already allowed a far-reaching processing of this subject in this year's update of the G-DRG system, whereby it has ultimately been possible to shorten the so-called OPS calculation gap.

And so, the analyses have not been based, as last year, on the attribute „stroke unit“ as the specialist unit identificator, but on the complex treatment actually performed in the cases of stroke as defined by *neurological complex treatment of acute stroke* (8-981.*) in OPS Version 2005.

As a result, seven new DRGs have been created in MDC 01 *illnesses and disorders of the nervous system.* The basis DRG B69 *transient ischemic attack (TIA) and extracranial atherosclerosis* has been expanded by the criterion of neurological complex treatment of acute stroke. This DRG is now split according to severity on the basis of the neurological complex treatment of acute stroke and its length. The new DRGs B69A *transient ischemic attack (TIA) and extracranial atherosclerosis with extremely difficult CC and neurological complex treatment of acute stroke*, B69B *transient ischemic attack (TIA) and extracranial atherosclerosis with neurological complex treatment of acute stroke, longer than 72 hours, without extremely difficult CC* und B69D *transient ischemic attack (TIA) and extracranial atherosclerosis with neurological complex treatment of acute stroke, up to 72 hours, without extremely difficult CC* have been established.

Similarly, the basis DRG B70 *apoplexy* has also been split, whereby the following four DRGs have been established: B70A *apoplexy with artificial respiration >95 and <178 hours or with intercranial haemorrhaging and neurological complex treatment of acute stroke, longer than 72 hours*, B70B *neurological complex treatment of acute stroke, longer than 72 hours*, *or with systemic thrombolysis, without intercranial haemorrhaging, length of stay longer than one day,* B70D *apoplexy with neurological complex treatment of acute stroke, up to 72 hours, without intercranial haemorrhaging, length of stay longer than one day,* and B70F *apoplexy with neurological complex treatment of acute stroke, death <4 days after admission.* Here too, neurological complex treatment of acute stroke has been established as an additional criterion and is now, subject to the duration of treatment, relevant to grouping alongside the condition of intercranial haemorrhaging.

Numerous other criteria relevant to outlay were extensively analysed, of which the criterion of systemic lysis has been realised in DRG B70B.

In addition, it has been possible to condense DRG B83C with DRG B70A, whereby, at the same time, the duration of artificial respiration as an access condition for DRG B70A has been lowered to >95 and <178 hours.

In the 2005 version of the G-DRG system, cases of stroke with long-term artificial respiration and additional operative procedures have been grouped in DRGs with a lower cost weight than the DRG in which they would have been grouped without an operative procedure.

By altering the allocation logic, an improved reflection of these case of stroke with both artificial respiration and operative procedure has been achieved in the basis DRG B02 *complex craniotomy or spinal column operation or other involved operation on the nervous system with artificial respiration >95 hours* or in the case of early rehabilitation in DRG B11Z *early rehabilitation with craniotomy, major spinal column operation, specific OR procedure or elaborate operation on the nervous system with artificial respiration >95 hours*, so that an appropriate reimbursement now results.

The operative section of MDC 01 has also been subjected to an intensive examination with regard to the neurological complex treatment of acute stroke; however, due to the low percentage of cases in the augmentative calculation data provided, no adequate

analysis that would have allowed a representation in line with the wishes of the proposers or on the basis of separate analysis has been possible this year.

OPS code 8-981.* *neurological complex treatment of acute stroke* will be documented in the normal way in the data from 2005 available as a basis for the update for 2007, which will enable extensive analyses to be made.

3.3.2.24 Pain Therapy

In OPS version 2005, code 8-918 has been split according to length of treatment:

8-918.0 *multimodal pain therapy: minimum 7 maximum 13 days of treatment*

8-918.1 *multimodal pain therapy: minimum 14 maximum 20 days of treatment*

8-918.2 *multimodal pain therapy: minimum 21 days of treatment*

Proposals to already reflect this differentiation in the pain therapy DRGs of the 2006 version of G-DRG were not calculable in the proposed form since the codes were not yet present in the data of the calculation hospitals. This was also not capable of being reliably simulated by auxiliary analyses.

When the *multimodal pain therapy* codes split on the basis of length of treatment are present in the calculation data of 2005 there will be considerably wider possibilities for making analyses. This can also be expected, with time-delay, from the code *multimodal pain therapeutic short-time treatment* newly incorporated in OPS version 2006.

Proposals were made in the recommendation procedure for establishing new DRGs for *multimodal pain therapy in the case of malignant tumour*, but this was not possible due to the low number of cases concerned in the calculation data.

Proposals for allocating OPS codes for specific pain therapeutic procedures (permanently implantable spinal catheter and implantable medication pumps for intrathecal anaesthesia) to various DRGs, was analysed, but could not be realised since only very few cases in the calculation hospital data were affected and the proposal could therefore not be evaluated.

Therefore, the DRGs for multimodal pain therapy created last year in MDC 01 *illnesses and disorders of the nervous system*, MDC 08 *illnesses and disorders of the musco-skeletal system and connective tissue* MDC 19 *psychological illnesses and disorders* and MDC 23 *factors that affect the state of health, and other demands upon the health system* remain; the calculation of a cost weight for DRG U42Z *multimodal pain therapy in the case of psychological illnesses and disorders* was not possible for 2006 *on the basis of the data* available.

3.3.2.25 Victims of Severe Burns

Unchanged from G-DRG system version 2005, two of the DRGs relating to the medical treatment of burns could not be apportioned a cost weight.

The DRGs in question are:

- Y01Z *operative interventions or artificial respiration >95 hours in the case of severe burns* and

- Y61Z *severe burns*

The reason for this is to be found, as previously, in an insufficient calculation base with regard to case numbers and cost homogeneity (high number of longliers) to enable the setting of fixed sums.

Proposals were made in the recommendation procedure for 2006 to additionally allocate certain second-degree burns (severity IIb in association with the procedures of *eschatology* or *split skin transplantation*) to DRG Y01Z. Since a differentiation between the degrees of severity IIa and IIb is not yet representable in ICD-10-GM version 2004, several variation of this proposal have been calculated on the basis of existing attributes. As a result, it has proved possible to include second-degree burns of over 30% of the body surface concerned in DRG Y01Z.

3.3.2.26 Tuberculosis

It had already been possible in the G-DRG system update for 2005 to widen the definition of the basis DRG E76 *tuberculosis* to include tubercular mycobacteriosis and forms of tuberculosis that do not primarily affect the respiratory organs. This year, it has been possible to realise a proposal for moving pneumoconiosis in combination with tuberculosis from the basis DRG E74 into the basis DRG E76, since analysis showed that these cases could be appropriately reflected in DRG E76. Thereby, in the 2006 version of the G-DRG system, patients with pneumoconiosis and tuberculosis and a length of stay beyond 14 days, are also allocated to an unevaluated DRG on the basis of the history of their length of stay and the proportion of longliers.

Furthermore, the reflection of tuberculosis in ICD-10-GM version 2006 has been differentiated in respect of the resistance of mycobacteria against antituberculotica with the code U82.-! *mycobacteria with resistance to antituberculotica (first-line medicine).* It is possible that a corresponding differentiation of case with tuberculosis can thereby be made in future calculations.

3.3.2.27 Accident Surgery

The G-DRG system has reflected accident surgery services in two MDCs since version 1.0. In the process, severe multiple injuries are allocated to MDC 21A *polytrauma*, other injuries predominantly to MDC 08 *illnesses and disorders of the musco-skeletal system and connective tissue*. This separation has fundamentally proved its worth over the previous years as well as in this year's calculation.

Multiple Interventions in MDC 08

Cases that feature multiple injuries but nevertheless still do not meet the conditions of MDC 21A *polytrauma,* or case in which multiple interventions were necessary for other reasons, have proven to be problematic. In G-DRG system version 2005, these cases were allocated to the operative DRGs of MDC 08 – usually following the most involved intervention – whereby, whether one or more injuries were treated operatively was seldom relevant to grouping. Numerous suggestions were submitted in the recommendation procedure for improving the representation of these cases. Some of

these suggestions depended on attributes for defining multiple interventions that were less resilient, an example of which is provided by the suggested DRG with the definition “more than four operative procedures”. Other suggestions for establishing supplimentary remuneration for an “additional operative intervention” were similarly oriented.

In this context a “resilient” definition is one that produces as high a number of very involved cases while at the same time including as low a number of less involved cases as possible, both in the calculation data and in the (prospective) year of application 2006 – that is, it should show as little susceptibility to changes in encoding behaviour as possible. The number of encoded procedures alone does not fulfil these requirements. A solution that does not encompass all involved cases proves to be the most suitable when it avoids a debasement of involved cases by a strong mix of simpler cases through a high degree of selectivity.

It was possible to achieve this in several of the 2005 G-DRG system’s not very homogenous MDC 08 DRGs with a large number of cases with, amongst other things, the new function *intervention on multiple localisations*. This function considers it to be an increase in severity when “at least two (not banal) interventions on separate (and not directly adjacent) localisations” have been performed. Diagram 6 illustrates how “not directly adjacent” has been defined:

	Pelvis	Foot	Hand	Hip joint	Knee joint	Upper arm	Thigh	Scapula/ collarbone	Schoulder joint	Forearm	Lower leg	Spine
Pelvis				X			X					X
Foot											X	
Hand										X		
Hip joint							X					
Knee joint							X				X	
Upper arm								X	X	X		
Thigh												
Scapula/ collarbone									X			
Schoulder joint												
Forearm												
Lower leg												
Spine												

	Function "intervention on multiple localisations" TRUE
X	**Not considered as "multiple localisations" for the benefint of a resilient split**
	The same locations or redundant pairs

Diagram 6*: the function “intervention on multiple localisations”*

The function *intervention on multiple localisations* is a component in the definition of the following basis DRGs of MDC 08:

I02 *tissue/skin transplantation, except on the hand, with complicating procedures, intervention on multiple localisations, severe damage to soft tissue and difficult CC or with extremely difficult CC*

I08 *other interventions on the hip joint and femur*

I13 *complex interventions on the humerus, tibia, fibula and ankle joint*

I22 *tissue/skin transplantation, except on the hand, with extremely difficult or difficult CC*

Multiple interventions on the same localisation do not fulfil the conditions of the function described above. An example is provided by ambilateral interventions on the extremities. In this year's update, an ambilateral intervention could only be registered with the help of the logic *two procedures from table […]* since the supplimentary identification marker right/left/both was included for the first time in the 2005 version of the OPS. This logic describes both an ambilateral intervention (which in 2004 still had to be encoded using two OPS codes) and multiple interventions, uni- or ambi- lateral. To prevent a debasement of this split criterion by a change in encoding behaviour, less involved interventions have not been included in the tables used by the logic *two procedures from […]*.

In comparison to the 2005 version of G-DRG the constellation *ambilateral intervention or multiple interventions* is considered in a further four DRGs of MDC 08:

I08 *other interventions on the hip joint and femur*

I13 *complex interventions on the humerus, tibia, fibula und ankle joint*

I20 *interventions on the foot*

I57 *moderately complex interventions on the humerus, tibia, fibula and ankle joint*

Combined Splits

Further attributes that were comprehensively examined in the accident surgery DRGs were:

- the extent of soft tissue damage in the case of fractures
- infections of the bone or soft tissues
- PCCL
- infantile cerebral palsy
- additional interventions on the vessels, nerves, muscles and tendons

Constellations involving similar time and effort have been consolidated to limit the increase in complexity of the system in the face of numerous intricacy increasing factors in increasing numbers of DRGs. An example of this is provided by DRG I13A *complex interventions on the humerus, tibia, fibula and ankle joint with multiple intervention or complex procedure or complex diagnosis* (table 13):

G-DRG Version 2006 Definition Handbook Logic	Logic Content
At least two procedures in table TAB-I13-4 **or**	Two or more involved interventions **or**
Procedure with supplimentary identification marker B in table TAB-I13-5 **or**	Ambilateral intervention **or**
Diagnosis in table TAB-I13-1 **or**	Infection of the bone or soft tissues **or**
Procedure in table TAB-I13-6 or procedure in table TAB-I13-7 **or**	Additional interventions on vessels or nerves **or**
Procedure in table TAB-I13-8 **or**	Additional involved intervention on muscles and tendons **or**
Diagnosis in table TAB-I13-2 **or**	Fracture with severe damage to soft tissue **or**
Intervention on multiple localisations	Function described above

Table 13: definition logic of DRG I13A

Polytrauma

Serious multiple injuries will continue to be grouped in MDC 21A polytrauma in the G-DRG version 2006. The allocation logic of this MDC (*serious injury from at least two organ systems)* has basically remained unchanged since G-DRG 1.0. No evidence for supporting a move away from reflecting serious multiple injuries in a separate MDC of their own has been found during this year's update either.

However, it has been possible to cleanse individual blurring in this definition; code S06.9 *intracranial injuries, not further defined* (concussion can also be defined as such in the case of imprecise encoding), for example, has been deleted from the relevant table.

Furthermore, interventions on the spinal cord in the case of polytraumatised patients have been enhanced. The operations have been moved from DRG W02 *polytrauma with other OR procedures* to DRG W04 which is now called *polytrauma with interventions on the hip joint, femur, extremities and spinal column*.

It has been possible to achieve a differentiated reflection of especially involved patients in both basis DRGs, W04 *polytrauma with interventions on the hip joint, femur, extremities and spinal column* and *W02 polytrauma with other OR procedures* with a split *with complicating procedures or interventions on multiple localisations*.

New in MDC 21A *Polytrauma* is DRG W36Z *intensive care medicine complex treatment >1104 points in the case of polytrauma.* The DRGs defined by *intensive care medicine complex treatment* are presented in detail in chapter 3.3.2.14.

3.3.2.28 Care of Children

The systematic examination of all DRGs for possible splits according to various age groups played a large role in this year's update of the G-DRG system, as it does in every year. While a total of 55 DRGs were split according to age in the DRG system version 2005, it was possible to establish age splits for a further 51 DRGs for the G-DRG system version 2006, bringing the total of DRGs differentiated according to (child) age to 106.

Special attention was again paid to reflecting the long-term artificial respiration of children and newborn infants. The grouping of newborn infants subjected to long-term artificial respiration in the respiration DRGs of the pre-MDC was also examined during this process. However, the changes simulated in this respect could not be realised since they did not improve the system as a whole. It has nevertheless been possible to differentiate the representation of children aged <16 years in three of the five basis DRG for cases of long-term artificial respiration. These are in detail the DRGs A06B, A09A and A13D.

The representation of anorectal deformities was improved in the area of gastrointestinal illnesses. These will no longer be grouped in the basis DRG G11 *pyloromyotomy or anoproctoplasty and reconstruction of anus and sphincter* in future, but in DRG G17Z *other rectum resection*, which entails a significant upward revaluation of these involved cases. The representation of cases with autonomous somatoform function disorders of the upper and lower digestive system has also changed, and from 2006 onwards they will be grouped in DRG U64Z *fear disorders or other affective and somatoform disorders* or DRGs U41Z *socio- and neuropaediatric therapy* or U43Z *psychosomatic therapy, age <18 years* (in cases of a socio-, neuro- and paediatric psychosomatic or psychosomatic therapy).

A differentiated encoding of these therapies according to length of treatment is possible for the first time from 2006 onwards with OPS code 8-986 *multi-modal rheumatological complex treatment of children and the young*. The inclusion of this code in the new unevaluated DRG I97 *rheumatological complex treatment in the case of illnesses and disorders on the musco-skeletal system and connective tissue* was made possible for the 2006 version of the G-DRG system by special analysis that took account of a relevant length of stay, the availability of "rheumatological diagnoses" and the minimum criteria subsumed under the code 8-986. In addition, cases with polyarticular and oligoartikular juvenile chronic arthritis with joint contracture or extrusion have been upwardly revaluated by being grouped in DRG I66A *other illnesses of the connective tissue, length of stay more than one day, with multiple complex diagnoses or with complex diagnosis, with dialysis.*

Detailed remarks concerning the supplementary remunerations listed in appendices 2, 4, 5 and 6 of the FPV 2006 can be found in chapters 3.3.2.19 (subject oncology) as well as 2.5 and. 3.4.1.3 (subject supplementary remunerations).

MDC 15

In the 2006 version of the G-DRG system MDC 15 *newborn infants* contains a total of 42 DRGs, which is four more than the 2005 version. For one, DRG P60B has been subdivided with a further degree of severity on the basis of the reason for admission "transferral". DRG P60B *newborn infant, transferred <5 days after admission without*

significant OR procedure, transferred thereby contains cases which feature “V” (transferral) or “K” (transferral – admission – from another hospital within the framework of a cooperation). Cases of admission to the appropriate children’s clinics or departments for further treatment have been thereby upgraded. DRG P60C *newborn infant, transferred <5 days after admission without significant OR procedure, not transferred* contains all other cases covered by the DRG P60B in the 2005 version of the DRG system not bearing “transfer” as the reason for admission but featuring “transfer” as the reason for discharge – as is also true of all cases in DRG P60B.

In the 2006 G-DRG version, cases with an admission weight <999 grams have first been differentiated on the basis of whether or not a significant OOR procedure has been performed. These will in future be grouped in the DRGs P61A *newborn infant, admission weight <600 g with significant OR procedure,* P61C *newborn infant, admission weight 600–749 g with significant OR procedure,* P62A *newborn infant, admission weight 750–*874 *g with significant OR procedure* and P62C *newborn infant, admission weight 875–*999 *g with significant OR procedure*.

In the field of surgical interventions, a further point of emphasis of analysis lay in the reflection of multiple interventions within the MDC 15, which are most evident in cases of new born infants with congenital deformities. However, no alteration in this area could be realised this year since only a few cases were available for calculation in the data of the calculation hospitals.

It was possible to delete DRG P03D *newborn infant, admission weight 1000–1499 g with significant OR-procedure or artificial respiration >95 hours, without serious problems*, which because of similar cost features has been condensed into DRG P03C.

Proposals were received this year again for upgrading procedures as “significant OR procedures” in the case of the basis DRGs P03 to P06 or the deletion of procedures (e.g. provision of oxygen or phototherapy for newborn infants), that have a relevance for classification in the DRGs P65C, P66C and P67C. However, none of the simulations resulted in an improvement for the system as a whole and they have therefore not been considered. Numerous calculations on the inclusion or deletion of diagnoses from the table *serious problems in the case of newborn infants,* for which concrete information from the recommendation process was present, were also undertaken. It was possible to realise the deletion of diagnose T88.4 *failed or difficult intubation*. The inclusion of a diagnosis was in many cases not possible due to the attribute being “incompatible with strain”. This means that a diagnosis is so widely defined that both very serious and minor illness can be encoded under it, as is the case with the code P29.1 *cardiac arrhythmia in the case of newborn infants* for example, thereby providing no cost differentiation.

The proposal to group children with a weight of less than 3,500 g in the MDC 15 *newborn infants* on a pre-MDC level was once again calculated, but failed again this year to produce a positive effect on the system as a whole that would have made realisation possible.

AS was the case in 2005, all DRGs of MDC 15 are also exempt in the coming year from the re-entry rule according to para. 2 sections 1 and 2 FPV 2006.

3.3.3 Formal Changes

3.3.3.1 Renaming of Basis DRG Numbers (ABC versus ZZZ)

The number of unsplit basis DRGs (so-called Z-DRGS) rose significantly in the 2005 version of the G-DRG system despite an increasing differentiation in the DRGs. The increase in unsplit basis DRGs resulted from dividing previously split basis DRGs into two or more independent basis DRGs (e.g. F19A/B versus F19Z/F55Z) to enable a more consequent grouping according to cost weight. In this context, the lack of a clear overview of related basis DRGs has been criticised and the desire expressed for greater transparency and comprehensibility of alterations. This has led to a comprehensive renaming of basis DRGs which had been allocated various basis DRG numbers last year as a result of classification.

The DRGs received the previous (joint) basis DRG number when simple split criteria were present, e.g.:

- PCCL
- age
- diagnoses
- length of stay

Simple severity splits became identifiable again by bringing these DRGs together. A total of 81 DRGs were correspondingly renamed. The DRGs affected by renaming are identified in the migration table published on the institute's homepage.

The following overview (table 14) provides an example of renaming by comparing the 2005 version of the DRG system and the 2006 version:

G-DRG-System, Version 2005	G-DRG-System, Version 2006
F19Z other percutaneous transluminal operation on the heart, aorta and Lung vessels with extremely difficult CC	**F19A** other percutaneous transluminal operation on the heart, aorta and Lung vessels with extremely difficult CC
F55Z other percutaneous transluminal operation on the heart, aorta and Lung vessels without extremely difficult CC	**F19B** other percutaneous transluminal operation on the heart, aorta and Lung vessels without extremely difficult CC

Table 14: example of renaming of basis DRG numbers

3.3.3.2 Decondensation

A further wish for greater transparency and comprehensibility was expressed in regard of the condensation of DRGs undertaken last year. The G-DRG system update for 2005 initially gave rise to more than 1,000 case groups. This very large number of DRGs was then condensed to the 878 case groups (2005 system) of the case-based fixed-sum catalogue and thereby significantly reduced. A division (decondensation) of

the complicated condensed DRGs of the 2005 system was suggested for benefit of a greater degree of transparency was suggested and achieved for a total of six DRGs.

The following overview (table 15) provides an example of decondensation by comparing the 2005 version of the DRG system and the 2006 version:

G-DRG-System Version 2005	G-DRG-System Version 2006
F07Z amputation with additional vascular intervention **or** other interventions with heart-lung machine, age <1 year or with complicating procedures or complex operation	**F28A** amputation with additional vascular intervention
	F07Z other interventions with heart-lung machine, age <1 year or with complicating procedures or complex operation

Table 15: example of decondensation

3.3.3.3 Sorting

The Problem of "Inferior Reimbursement in the Case of Multiple Services" and the Rudiments of a Solution in 2004

The problem of a case where an additional service is carried out being allocated to a DRG with a lower cost weight than would have been the case without the additional service can be termed "inferior reimbursement in the case of multiple services". Much space was devoted to the solution of this problem within the framework of last year's update. The changes already implemented in the 2005 version of G-DRG can be summarised in substance by two points:

- the creation of new DRGs for typical multiple interventions
- a consistent sorting of all DRGs of the operative sections in descending order of cost weight

Subsequent to the second point, numerous new basis DRGs have been created in the respective MDCs. Although, as explained in chapter 3.3.3.1, it was possible to carry out a renewed consolidation of simple splits to one basis DRG for the 2006 version of the G-DRG system despite the retained sortation, the figure of 40 operative DRGs was exceeded in the MDCs 05 *illnesses and disorders of the circulatory system* and 08 *illnesses and disorders of the musco-skeletal system and connective tissue*. This has resulted in the number array for the operative section (01-39) being exceeded in these two MDCs and therefore operative DRGs can carry numbers between 40 and 99.

Changes in 2005

The basic problem of inferior reimbursement in the case of multiple services was most pronounced in the operative sections, but not limited to them. For example, it was still possible in the 2005 version of G-DRG to allocate a case that met the conditions of DRG R60A *acute myeloid Leukaemia with chemotherapy, with complicating diagnosis or dialysis or port implantation* (cost weight 5.859) to the basis DRG R11 *lymphoma*

and Leukaemia with other OR procedures (cost weight from 1,079 to 2,362), which represents a significant devaluation of the case.

For this reason, a sortation spanning the sections was undertaken as far as possible for all DRGs in the MDC 17 *haematological and solid tumours*.

In addition, a joint sortation of the other and the medical section was undertaken in 4 MDCs:

MDC 03 *Illnesses and disorders of the ear, nose, mouth and throat*

MDC 06 *Illnesses and disorders of the digestive organs*

MDC 07 *Illnesses and disorders of the hepatobiliary system and pancreas*

MDC 11 *Illnesses and disorders of the urinary organs*

A section-spanning sortation was also simulated but not implemented for all other MDCs that feature both an other and a medical section, since it resulted in no improvement in the system as a whole.

3.3.4 Transition to and Adaptation of Updated ICD and OPS Classifications

3.3.4.1 *Transition to ICD-10 and OPS Classifications Valid from 1st January 2006*

The medical data from 2004 on which the G-DRG system update is based, depends on diagnoses and procedures encoded according to the 2004 version of ICD-10-GM or the 2004 version of OPS 301. G-DRG Version 2004/2006, made available on the internet site of InEK as the first of the G-DRG versions that will be published, presents the DRG classification with these versions of the codes. From 1st January 2006 the 2006 version of ICD-10-GM and the 2006 version of OPS are to be applied. The G-DRG definition handbook had to be adapted to the then valid versions. This adaptation took place in two steps:

1. transition to ICD-10-GM Version 2005/OPS Version 2005
2. transition to ICD-10-GM Version 2006/OPS Version 2006

Each respective version was subsequently published (G-DRG Version 2005/2006 und G-DRG Version 2006).

ICD-10-GM Version 2006, valid from 1st January 2006, contains a total of 13,173 codes, 76 more than ICD-10-GM Version 2005 (13,097). More than 95% of the codes (13,030) are completely (code and text) identical.

OPS Version 2006 contains a total of 22,812 codes (only official OPS), that is 381 more than OPS Version 2005 (22,431). The overwhelming majority of these codes are also completely identical, (with 21,187 code and text identical entries also more than 90%).

Significant for the first transition step is the obligatory specification of side localisation newly incorporated in OPS Version 2005. This affects 12,648 codes (official OPS). These codes are marked with "↔" in the OPS and definition handbooks of the G-DRG versions 2005/2006 and 2006. The separate codes for unilateral and ambilateral procedures of OPS-301 Version 2004 are thereby replaced by one code with an appropriate additional marker.

3.3.4.2 Dealing with Non-identical Codes

Identical codes do not require transition. For non-identical codes, the chosen transition consisted mostly of a classificatory transition oriented on the transition table of the German Institute for Medical Documentation and Information (DIMDI). However, to some extent it is necessary to deviate from this. Two variants can be set in this respect:

- classificatory transition
- transition based on grouping algorithms

These variants can be explained using the following examples.

Example 1 – Classificatory Transition

Old code (ICD-10-GM Version 2005):

G20	*primary Parkinson's syndrome*

New codes (ICD-10-GM Version 2006):

G20.00	*primary Parkinson's syndrome with no or little impairment: without impact fluctuation*
G20.01	*primary Parkinson's syndrome with no or little impairment: with impact fluctuation*
G20.10	*primary Parkinson's syndrome with moderate to serious impairment: without impact fluctuation*
G20.11	*primary Parkinson's syndrome with moderate to serious impairment: with impact fluctuation*
G20.20	*primary Parkinson's syndrome with serious impairment: without impact fluctuation*
G20.21	*primary Parkinson's syndrome with serious impairment: with impact fluctuation*
G20.90	*primary Parkinson's syndrome not further defined: without impact fluctuation*
G20.91	*primary Parkinson's syndrome not further defined: with impact fluctuation*

All new codes have derived according to the DIMDI's transition table from the old G20 code. The concrete consequences for the definition handbook are:

- All eight new codes have taken the place of the old IDC code G20 in every table in the definition handbook version 2005/2006 in which the old code was listed. In this case four tables are affected:

- main diagnosis table of MDC 01 *illnesses and disorders of the nervous system*
- main diagnosis table of DRG B67 *degenerative illnesses of the nervous system*
- main diagnosis table of DRG B67, applied for sorting purposes in DRGs B67A and B67B (*degenerative illnesses of the nervous system in the case of morbus Parkinson*)
- Diagnosis table *adult age conflict*

- Each of the eight new codes has been handled in the CCL-Matrix like the old code, and thereby entered in line 30 of the CCL matrix. All CC exclusions of the old code G20 have been applied for all eight new codes respectively.

Example 2 – Transition Based on Grouping Algorithms

Two new codes for specific procedures for live liver donor surgery have been newly incorporated in OPS Version 2006:

5-503.5 *partial liver resection and hepatectomy (for transplantation): Hemihepatectomy on the right [resection of segments 5 to 8] for live donation*

5-503.6 *partial liver resection and hepatectomy (for transplantation): resection of other segment combinations for live organ donation*

In DIMDI's classificatory transition, these new codes are allocated to the OPS Version 2005 old code

5-503.x *partial liver resection and hepatectomy (for transplantation): miscellaneous.*

A transition oriented on this would have meant for the G-DRG classification that the new codes for live liver donor surgery in the G-DRG Version 2006 would have acquired the function of the old code. DRG Z02Z *Liver donation (live donor)* of the 2006 G-DRG System would not then have been reached by the new process. The corresponding cases would have been grouped in MDC 23 *factors, that influence the state of health, and other demands on the health system* on the basis of the main diagnosis Z52.6 *liver donor* specified by the German encoding guidelines, and allocated to the unspecific DRG Z01Z *OR procedures in the case of other conditions, that lead to demands on the health system*.

To prevent this, the transition to the two new codes has taken place in variance to the classificatory recommendation on the basis of the old code:

5-503.3 *partial liver resection and hepatectomy (for transplantation): partial resection on the left, for live organ donation*

In this way, it was possible to achieve an appropriate representation in DRG Z02Z *liver donation (Live donor)*.

3.3.4.3 Dealing with Newly Introduced Codes

There were three various ways of taking account in the definition handbook Version 2006 of codes newly introduced in the ICD-10-GM- und OPS classifications for which there was no DIMDI transition recommendation:

Variation 1: the Codes are not considered.

This represents the typical procedure following the introduction of new OPS codes in the G-DRG classification. Due to the absence of cost information regarding procedures that could not be encoded in the year the calculation data was complied, an assessment of these services is usually not possible. An example is provided by the new OPS Version 2006 codes from 8-987 *complex treatment in the case of colonisation or infection with multi-resistant pathogens*. These codes have no grouping relevance in the 2006 G-DRG classification of valid procedures.

A general disregard in the definition handbook is fundamentally only possible in the case of OPS codes. According to the logic of the system, a new ICD code must, however, be allocated to at least one DRG of the medical section of a MDC (or the invalid main diagnoses).

Incorporating a new code without grouping relevance can result in an encodable diagnosis or procedure that is possibly associated with considerable outlay becoming fundamentally irrelevant for the DRG allocation and thereby runs the risk of not being encoded, which subsequently makes the calculation of these services more difficult.

Variation 2: DRGs are Formed or Changed on the Basis of New Codes in the ICD-10-GM and OPS-Classifications.

The calculation basis for such a process is usually absent. It is possible, however, to allocate certain codes to a DRG through an augmentative data compilation and consideration in the calculation. An example of this is provided by the OPS codes 8-985.* *Motivation treatment of suffers from dependency [qualified detoxification]*, which – as explained in detail in chapter 3.3.2.2 – are relevant to grouping in two basis DRGs.

Variation 3: Newly Created Codes are Allocated to Old Codes with a Similar Content or Outlay.

This process is applied for reflecting a number of newly incorporated procedures; for example, the bronchoscopic replacement of a splint was treated in the 2006 version of the handbook analogously to the respective implantation using this process.

New codes without DIMDI transition recommendations are usually handled according to variation 1. Variations 2 and 3 are applied in exceptional cases. Consequently, it was possible to maintain the basic principle of the transition to ICD and OPS codes of achieving the greatest degree of content congruency possible between the versions 2004/2006, 2005/2006 and 2006.

3.3.4.4 Dealing with the Supplementary Identification Markers for Side Localisation

A comprehensive of classification codes became necessary with the introduction of the supplementary identification marker for side localisation in OPS Version 2005. The transition to the OPS Version 2005 codes represented this year's first step in the two-stage transition process. Last year, the problem of "dealing with the supplementary identification marker in the transition process" had arisen in the second stage of the transition.

The procedural method applied in 2005 has been retained without change. Attention should be paid to two different constellations here:

Constellation 1 – Codes Already Differentiated According to "Unilateral / Ambilateral"

Differentiated codes for unilateral and ambilateral interventions already existed in OPS 301 Version 2004 for certain interventions. These are replaced in OPS Version 2005 by a new code that specifies localisation:

OPS 301 Version 2004

5-324.0- *simple lobectomy and bilobectomy of the lung, unilateral without radical lymph node dissection, open surgery*

5-324.4- *simple lobectomy and bilobectomy of the lung, ambilateral without radical lymph node dissection, open surgery*

OPS Version 2005

5-324.a-↔ *simple lobectomy and bilobectomy of the lung, without radical lymph node dissection, open surgery*

An alteration to the grouping logic had to be made in some cases since a virtual negation of code differentiation would have thereby taken place without due consideration of the supplementary side identification marker. This was necessary where the unilateral and ambilateral codes from OPS 301 version 2004 had different functions in the DRG algorithm. An example of this is presented by DRG E01Z *revision interventions, ambilateral lobectomy*, *and extended lung resections*, which, in G-DRG Version 2004/2006, contains only the codes from 5-324.4-, and not the codes from 5-324.0-. Here an adaptation of the logic was necessary for G-DRG-Version 2005/2006 to ensure that the DRG content did not change in comparison with the calculation despite the negation of code differentiation. For this purpose, a new syntax had to be integrated in the Grouper software and the definition handbook adjusted, this had already been done last year. It is furthermore possible to specifically consider ambilateral interventions in the Grouper with the polling logic "procedure with supplementary identification marker B".

Constellation 2 – Auxiliary Construction "Ambilateral Intervention" in the Algorithm

Up until now, it was only possible in the grouping algorithm to poll DRGs with ambilateral interventions, in as far as no specific codes for unilateral/ambilateral procedures existed, non-specifically using the polling logic "two procedures from one table". However, this also included more than one intervention on one and the same side. All logics in which such multiple or ambilateral interventions are polled had to be adjusted for G-DRG version 2005/2006. An example is provided by DRG D01A *cochlear implantation, bilateral*. Here, the logic

"at least two procedures in table TAB-D01-1"

from the G-DRG version 2004/2006 had to be altered to

"at least two procedures in table TAB-D01-1 or procedure with supplementary identification marker B in table TAB-D01-1"

to ensure the same content is reflected the G-DRG version 2005/2006.

It was fundamentally not possible to dispense with the criterion *"at least two procedures in table […]",* since DRG calculated this way also include two unilateral interventions. The side localisation available in future will provide a better calculation basis for such analyses.

3.3.4.5 Adaptations of the ICD-10 and OPS Classifications

As was the case in the preceding year, recommendations for updating ICD-10-GM version 2006 und OPS version 2006 classifications could only be submitted to the German Institute for Medical Documentation and Information (DIMDI). Recommendations for reformulating codes received by InEK within the framework of the process have been forwarded to the appropriate DIMDI department.

The necessity for further new codes beyond the alterations suggested in the recommendation procedure for 2006 became apparent during the process of updating the G-DRG system. InEK accordingly applied for these at DIMDI, and it was possible to include them at short notice in OPS version 2006 and ICD-10-GM version 2006 respectively.

For example, on the basis of the case numbers and costs presented by the calculation hospital data, it became apparent that it is sensible in the case of code 8-980 *intensive care medicine complex treatment* to further differentiate the codes 8-980.2 to 8-980.6 on the basis of complexity points, in order to enable more detailed representations in calculations that follow.

Further examples are provided by the new codes 8-012 *application of list 1 medicines* and 8-013 *Application of list 2 medicines* for settling supplementary remuneration of extremely expensive medicines.

3.3.5 Adaptations of the German Encoding Guidelines

There was a consensus among the self-governing partners that the thorough revision of the German Encoding Guidelines begun for 2005 with the intent of achieving a slim-down should be continued for 2006. As a result, individual encoding guidelines were again deleted or condensed to avoid redundances of content both within the DKR and to ICD-10-GM and OPS. What is more, an editorial revision was also undertaken as well as an adaptation to the changes in diagnosis/procedure classification and G-DRG classification for 2006.

The following provides a few examples of succinct changes/clarifications:

- radiotherapy: inclusion of analogous regulation in DKR 0201 of encoding inpatient admission for systematic radiotherapy of primary tumours and/or metastases
- clarification of the sequence of etiology/manifestation enciphering beyond the cross and star system

- clarification of the encoding of ICD-10-GM code Z37.-! *result of delivery* in DKR 1507

Furthermore, the necessity to alter several encoding guidelines also arose indirectly from the changes in ICD-10 and OPS classifications described in chapter 3.3.4.5.

3.4 Statistical identification Numbers

3.4.1 Important Findings and Alterations over the Previous Year

3.4.1.1 Extension and Modification of the Case Groups

Identification Numbers

The 2006 version of the G-DRG system contains a total of 954 DRGs. Table 16 provides an overview of the changes in comparison to the 2005 version of the G-DRG system.

	No. of DRGs	Change over previous year
G-DRG System 2006	954	+ 76
of which in case-based fixed-sum catalogue	912	+ 67
of which unevaluated (appendix 3)	40	+ 7
of which purely day-patient DRGs	2	+ 2
of which explicitly one-day DRGs	17	- 2
Of which implicitly one-day DRGs	241	+ 25

Table 16: overview of the 2006 version of the G-DRG system

40 evaluated supplementary remunerations (previous year 35) can be found in the catalogue of augmentative supplementary remunerations (appendix 2 FPV). The number of supplementary remunerations to be agreed upon on an individual hospital basis as per para. 6, section 1 KHEntgG (appendix 4 FPV) lies by 42 (previous year: 36).

Change in the Number of DRGs per MDC

Table A-4 of the appendix provides an overview of the changes in the number of DRGs per MDC.

3.4.1.2 Non-evaluated DRGs

In the 2006 G-DRG system 2006 the number of DRGs depicted as “not capable of fixed sum estimation” has increased over the 2005 G-DRG system by 7 to a total of 40 DRGs. These have been completely defined, so that for these DRGs only the extent of reimbursement remains to be negotiated on an individual hospital level according to para. 6, section 1 KHEntgG.

A thorough analysis of all DRGs was undertaken in line with previous year’s procedure:

- The homogeneity of all cases

- Inlier homogeneity
- Minimum case number
- Spread of length of stay
- Reimbursement for longliers proportionate to their day-based cost
- Possibility of a dependable, selective and precise classification on the basis of existing ICD-10 and OPS classifications – in association with specific encoding guidelines

The critical overall appraisal of these aspects has shown in the 2006 G-DRG system that the DRGs in the 40 case-based fixed sums listed in appendix 3 of the FPV 2006 are “incapable of fixed-sum estimation” due to a breach of one or more criteria.

3.4.1.3 Supplementary Remuneration

229 special and highly involved services were examined for the appropriateness of their representation in the DRG system by applying the procedure established the year before. The augmentative case information provided by the calculation hospitals formed, in turn, the central basis for defining and evaluating the services for supplementary remuneration. Table 17 presents the number of supplementary remunerations of the 2006 G-DRG system in comparison to those of the 2005 system:

	G-DRG System Version 2005	G-DRG System Version 2006
Supplementary remunerations assessed with a reimbursement sum		
Surgical and interventional procedures (incl. Dialyses and related procedures)	12	11
Administration of medicines and blood products	23	29
Supplementary remunerations as per para. 6, section 1 KHEntgG		
Surgical and interventional procedures (incl. Dialyses and related procedures)	25	28
Administration of medicines and blood products	9	11
Special forms of treatment	2	3
Total	**71**	**82**

Table 17: comparison of the number of supplementary remunerations in the G-DRG systems of 2005 and 2006

The special forms of treatment listed refer to *anthroposophic medicinal complex treatment* (ZE 2005-26/2006-26), *provision for the most severely disabled* (ZE 2005-36/2006-36) as well as naturopathic complex treatment (ZE 2006-40).

Diagram 7 presents the structural changes in the field of supplementary remuneration in the 2006 G-DRG system in comparison to the preceding year:

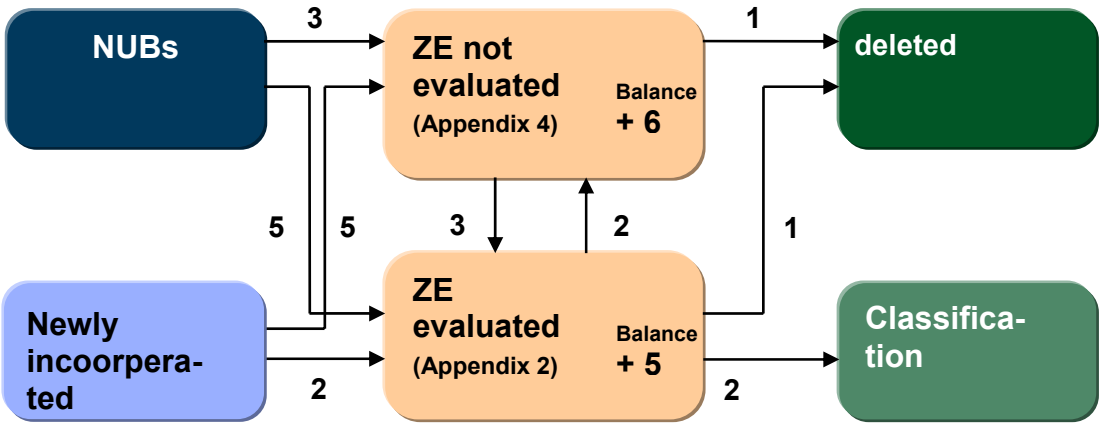

Diagram 7: *changes in the structure of supplementary remuneration in the 2006 G-DRG system in comparison to the preceding year*

40 supplementary remunerations were assessed with a reimbursement sum and incorporated in appendix 2 of the FPV 2006.

It was possible to include the services reflected by ZE 03 and 04 (*implantation or replacement of a tumorendoprosthesis*) in the classification. This is also true of the original ZE 08 *implantation or replacement of a neurostimulator for stimulating the brain, multiple electrode system*. ZE 22 *administration of Methotrexat, parenteral* has been deleted on the ground of too little cost relevance. The available data base for ZE 02 *Haemodia filtration* and for the *neurostimulators for the brain or spinal cord, multiple electrode system* represented in the former ZE 08, was insufficient for an evaluation, so that supplementary remunerations for the services concerned have been included as per para. 6, section 1 KHEntgG in appendix 4.

Conversely, an evaluation of 3 supplementary remunerations previously in appendix 4 was possible during this year's process (ZE 36 *plasmapheresis*, ZE 37 *extra corporal photopheresis*, ZE 38 *administration of human-immunoglobulin, specifically against cytomegalovirus infection, parenteral*). Furthermore, five services originating from the NUB process (ZE 48 *administration of Aldesleukin, parenteral*, ZE 49 *administration of Bortezomib, parenteral*, ZE 50 *administration of Cetuximab, parenteral*, ZE 52 *administration of Liposomal Doxorubicin, parenteral*, ZE 53 *administration of Pemetrexed, parenteral*), as well as two services newly introduced into the appraisal, have been defined and evaluated by means of supplementary remuneration, so that the number of evaluated supplementary remunerations in appendix 2 has increased by five in total.

The reimbursement sum for the evaluated operative and interventional procedures has mainly been determined by the employment of extremely expensive material (implants) and, where applicable, other procedure-related costs. A regressive price tendency was detectable in the field of medication, which was very pronounced in some areas. As a result, the lower dosage category (for adults) was deleted in the case of four supplementary remunerations (ZE 24 *administration of Paclitaxel, parenteral*, ZE 30 *administration of Prothrombin complex, parenteral*, ZE 43 *administration of Liposomal Amphotericin B, parenteral*, ZE 47 *administration of Antithrombin III, parenteral*). Dosage categories specifically applicable for the treatment of infants were defined for the administration of medication and blood products in the case of 11 supplementary remunerations (compare ch. 3.3.2.19).

42 services have been added to the list of remunerations to be negotiated on an individual hospital level, which is six more than last year. An evaluation with a supplementary remuneration and inclusion in appendix 2 was possible for three services (ZE 36 *plasmapheresis*, ZE 37 *extra corporal photopheresis*, ZE 38 *administration of human-iImmunoglobulin, specifically against cytomegalovirus infection, parenteral*) due to an improved data base. One supplementary remuneration (ZE 2005-20) was deleted at the request of the specialist body concerned. Services were complementarily included that met the definition criteria for a supplementary remuneration, but – as is the case with all services listed in appendix 4 of the FPV – could not be allocated a reimbursement sum on the basis of the data available. As a result, these supplementary remunerations are to be negotiated on an individual hospital basis in accordance with para. 6, section 1, line 1 KHEntgG.

The presentation of the supplementary remuneration in appendices 2 to 6 of the FPV 2006 has been done at the request of those sections of the self-governing partners responsible for accounting the services and is founded on the necessity of clearly applying the accounting keys to the defined service as set out in para. 301 SGB V.

3.4.2 Compression Effect

That both involved services and significantly less involved services of a DRG or DRGs are allocated similar cost weights is known as the compression effect. In this, a differentiation is made between

- the cost-calculatory compression effect and the
- documentary compression effect.

The cost-calculatory compression effect occurs when, within the framework of determining the raw case costs, the costs of a hospital are not allocated to cases on a the basis of causality, but spread using flat rate methods without differentiation over all cases. At its most extreme, every case is allocated the same cost value thereby making a differentiation in cost weight representation impossible.

The documentary compression effect arises when, on the one hand, cases with a high level of complexity and morbidity and correspondingly high costs are incorrectly allocated to case groups with a lower assessment due to incorrect documentation of individual characteristic relevant to case grouping. Then, on the other hand, cases with a low level of complexity and morbidity and correspondingly low costs are allocated to case groups with a higher evaluation due to incorrect documentation (here overcoding). This way the cost weights of DRGs with a high evaluation and those of DRGs with a low evaluation approximate each other.

Reasons for Further Reduction in the Compression Effect

As was also the case in the preceding year, an improved data base ensured that the system update has led to a marked reduction in both the documentary and cost-calculatory compression effects.

The fresh increase in the quality of encoding together with the further improvement in the allocation of individual costs to cases in the calculation hospitals have contributed to the reduction of both the documentary and the cost-calculatory compression effects. The extended plausibility verification (see ch. 2.1) combined with a laborious check on an individual case basis as well as explicit case analyses has also led to the possibility of further reduction in the compression of cost weights.

Illustrating the Reduction of the Compression Effect

The G-DRG system bandwidth can, for example, be measured by considering the quotients of the α- and (1–α) quantiles of the cost weights. The span of cost weights between low assessed and high assessed DRGs can thereby be rendered in numbers. The larger α is, the higher the quotient. When comparing two systems (e.g. the 2005 version of the G-DRG system and the 2006 version), an increase in the quotient signifies a reduction in the compression effect.

In each case, DRGs with a median length of stay of 1.0 are not considered in the analysis.

In diagram 5 the quotients for various α (0.95, 0.9, 0.8 and 0.75) of each consecutive G-DRG system (version 1.0 to version 2006) are presented in comparison.

For $\alpha = 0.95$, a comparison between the 2005 version of the G-DRG system and the 2006 version resulted, for example, in a quotient of 24.9. Last year (comparison of the 2004 version of the G-DRG system with the 2005 version) this lay by only 21.5. The bandwidth of the cost weights has increased here by 16%. For $\alpha = 0.8$ this bandwidth has increased by 8%.

The 2006 version of the G-DRG system has further increased the decompression of the system.

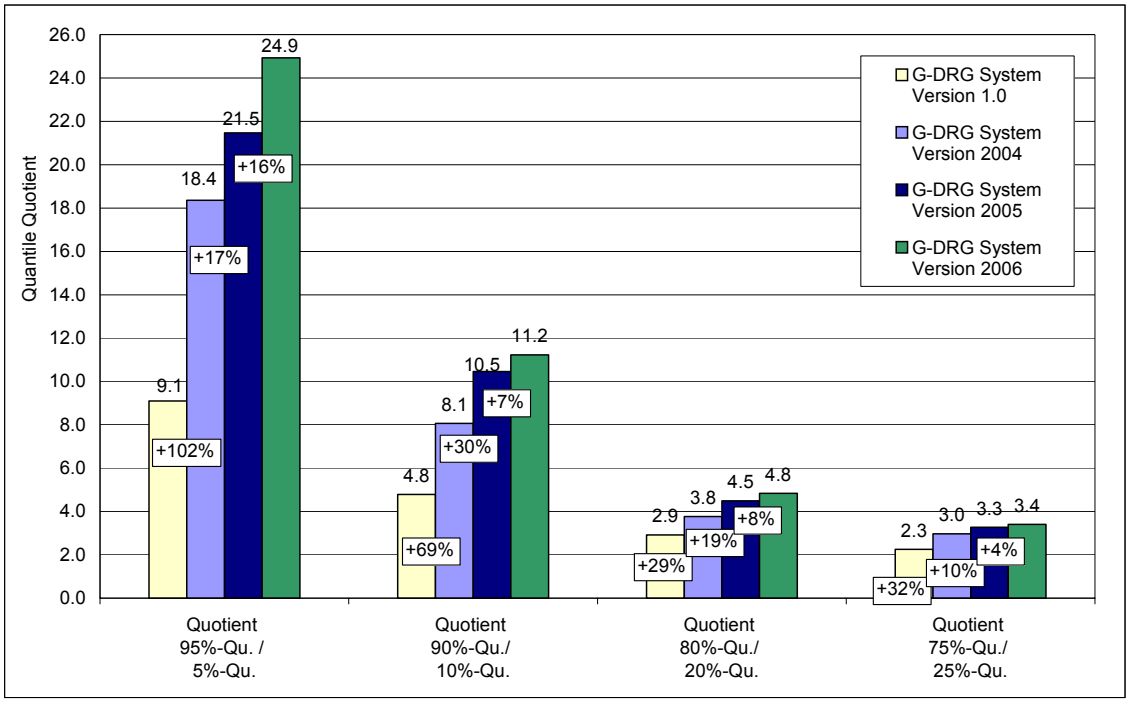

Diagram 8: Quotient from α- and (1–α)-quantiles for G-DRG systems version 1.0 to 2006 for $\alpha = 0.95$, $\alpha = 0.9$, $\alpha = 0.8$ and $\alpha = 0.75$

Another perspective also shows that is has been possible to sink the compression effect: The one percent quantiles for the cost weights of both the 2005 version of the G-DRG system and the 2006 version are calculated and compared (see diagram 9). It

can be seen that the most expensive cost weights of the 2006 system are higher than those of the 2005 system.

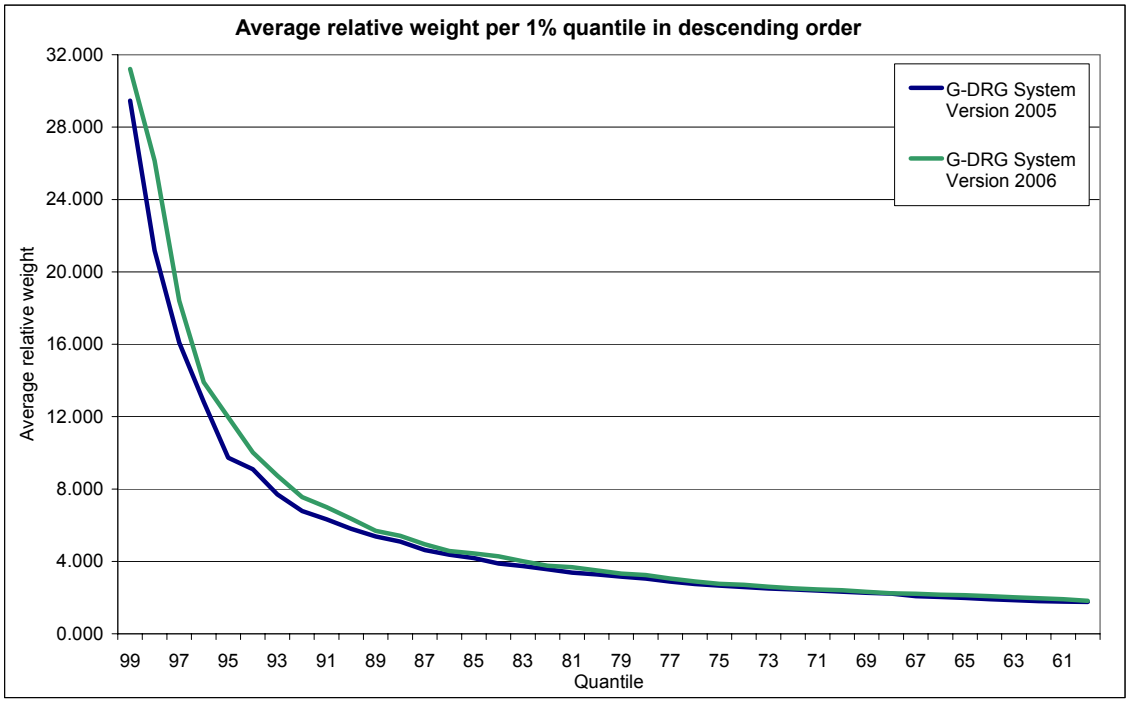

Diagram 9: one-percent quantile for the 2005 and 2006 G-DRG systems, in descending order

3.4.3 Statistical Quality of the Classification

Appraisal of the quality of fixed-sum systems of remuneration is based on their ability to establish cost homogenous categories. Mathematically this can be done by evaluating the quality of the classification with the help of the dimensions of cost spread. The R^2 value as a measurement of variance reduction (see ch. 3.4.3.1.), the homogeneity coefficient of case costs and the confidence interval around the median case costs of the inlier (see ch. 3.4.3.2) have been drawn upon to fulfil this purpose.

The analysis was based on the total of cases treated in main departments available following verification and cleansing. These 2,425,876 cases (see ch. 3.2.1.1) were sorted according to both the 2005 version of the G-DRG system and the 2006 version.

Only the DRGs allocated with a cost weight in the case-based fixed-sum catalogue for main departments were analysed. Both error DRGs 960Z *not sortable* and 961Z *inadmissible main diagnosis* as well as the unevaluated DRGs (appendix 3) remained unconsidered. Apart from which, the explicit one-day length of stay DRGs of both systems were also excluded from the analysis since their determination was not based exclusively on grounds of cost homogeneity.

This resulted in the utilisation of 825 (G-DRG-System Version 2005) and 893 (G-DRG-System Version 2006) DRGs for analysis purposes.

3.4.3.1 Analysis of Variance Reduction

The R^2 value as a measurement of variance reduction was utilised to evaluate the 2006 version of the G-DRG system in comparison to the 2005 G-DRG system. This statistical dimension presents the proportion of cost spread defined by the classification. The lower the proportion of defined spread within the categories in comparison to the spread between the categories, the higher the quality of the system.

In both versions the R^2 values were calculated on the basis of the data from 2004 – for all cases and for inlier – and compared to each other. The following dimensions were the result (see table 18):

	G-DRG System Version 2005	G-DRG System Version 2006	Improvement (in %)
R^2 value on basis of all cases	0,6617	0,6805	2,8
R^2 value on basis of Inliers	0,7759	0,7884	1,6

Table 18: comparison of R^2 variance reduction in the 2005 version of the G-DRG system and in the 2006 version of the G-DRG system (data base: data from 2004)

Based on all cases, it has been possible to improve the variance reduction by just under 3%. A R^2 value of almost 0.79 has been achieved for inlier. It has therefore been possible to increase the R^2 value as a measurement of variance reduction on the basis of inlier in the 2006 version of the G-DRG system by 1.6% when compared to the 2005 version of the G-DRG system. These increases should be assessed in the light of the altered control sample structure. Due to the addition of the 81 calculation hospitals that have taken part in the calculation for the first time, there exists a latent danger of a heightened compression effect resulting in a steadying or even reduction in the variance reduction achieved. Taking this into account, the increase in variance reduction displayed in table 18 should be regarded as significantly higher than it can be presented in by pure calculation.

The tendency is for a greater number of categories to affect an increase in the R^2 value. An automatic R2 increase is inherently associated with in the increase of DRGs from 878 to 956 (or from 825 to 893 DRGs in the data base for the R^2 analysis). This is, however, of lesser significance.

Based on all cases, the increase of 893–825 = 68 DRGs resulted in a (theoretical) R^2 increase of 0.000028 in the case of non target-oriented, i.e. random, classification development. The actual increase in the R^2 value in the case of target-oriented classification development (including the increase in number of DRG categories) amounts to 0.0189. Thereby, the improvement in the variance reduction achieved by a target-oriented development of the G-DRG system is 675 times greater than the effect of a simple increase in the number of DRGs.

On the basis of Inlier, this factor is 347 times greater (theoretical R^2 increase of 0.000036 through DRG increase in the case of random classification development, actual increase in the R^2 value of 0.0125 in the case of target-oriented classification development).

Apart from considering the entire G-DRG system, the variance reduction can also be calculated for each individual MDC.

Diagram 10 presents the R² values for each MDC on an inlier basis. The MDCs are sorted according to R² value (left-hand scale) for the 2006 version of the G-DRG system in descending order.

The Index reflects the ratio between the variance reduction of each MDC of the 2006 version of the G-DRG and the variance reduction of each MDC of the 2005 version of the G-DRG system. A reference line for the index value 100 facilitates the comparison (right-hand scale).

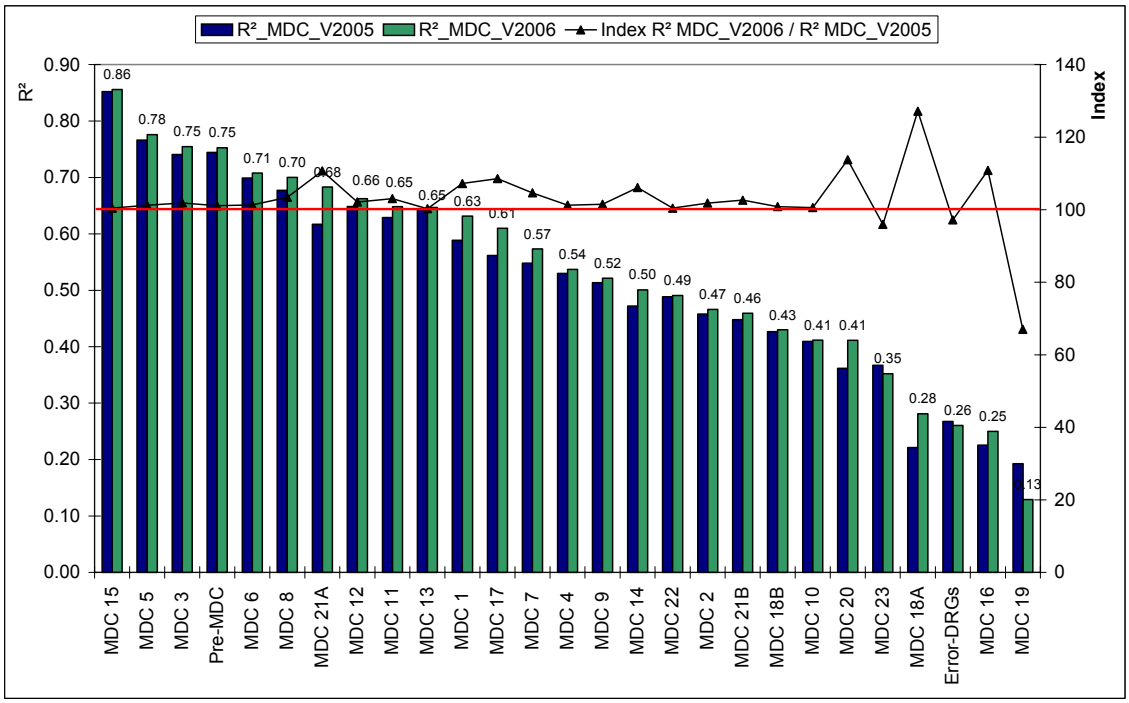

Diagram 10: R² value of each MDC for the 2005 and 2006 versions of the G-DRG systems, basis: Inlier (Sorted according to R² value for 2006 version of the G-DRG system), data from 2004

The illustration clearly reveals significant differences between MDC in variance reduction. A positive change in the 2006 version of the G-DRG system compared with the 2005 version is apparent in all but three MDCs (index >100).

In the following MDCs

- MDC 18A *HIV* (index 127),
- MDC 20 *Alcohol and Drug use and alcohol and drug induced psychological disorders* (index 114),
- MDC 16 *illnesses of the blood, the blood building organs and the immune system* (index 111) and
- MDC 21A *Polytrauma* (index 111)

the most significant percentage increase in the R² value could be achieved.

The variance reduction in the MDCs 01, 05, 06 and 08, which constitute just about half the cases of the analysed DRGs in both versions of the G-DRG system could also be increased:

- MDC 01 *illnesses and disorders of the nervous system:* from 0.59 to 0.63 (index 107)
- MDC 05 *illnesses and disorders of the circulatory system:* from 0.77 to 0.78 (index 101)
- MDC 06 *illnesses and disorders of the digestive organs:* from 0.70 to 0.71 (index 101)
- MDC 08 *illnesses and disorders of the musco-skeletal system and connective tissue:* from 0.68 to 0.70 (index 103)

3.4.3.2 Analysis of Cost Homogeneity

A further possibility to analyse the improvement of the G-DRG classification is provided by comparing the DRG cost homogeneity of the two G-DRG systems, the 2005 version and the 2006 version, with the help of the cost homogeneity coefficients.

Based on the inlier of the analysed DRGs (data from 2004), the following situation results when the DRGs are divided into categories on the basis of the homogeneity coefficients (see table 19):

Cost Homogeneity Coefficient	**G-DRG System Version 2005**		**G-DRG System Version 2006**		**Change in Share**
Range	*No.*	*Share (in %)*	*No.*	*Share (in %)*	*Change (in %)*
Under 55%	10	1.2	5	0.6	-53.8
55 to 60%	58	7.0	34	3.8	- 45.8
60 to 65%	230	27.9	197	22.1	- 20.9
65 to 70%	256	31.0	323	36.2	+ 16.6
70 to 75%	185	22.4	224	25.1	+11.9
75% and more	86	10.4	110	12.3	+18.2
Total	**825**		**893**		

Table 19: comparison of homogeneity coefficient of the 2005 version of the G-DRG system and the 2006 version. Basis: Inlier, data from 2004

The categories with a higher degree of homogeneity are relatively and absolutely more strongly represented in the 2006 version of the D-DRG system that in the 2005 version.

The increase in highly cost homogenous DRGs is also evident when the homogeneity categories are accumulated. The ratio between the proportions in the respective homogeneity category for the 2006 version of the G-DRG system and for the 2005 version is given as an index (right-hand scale) as well as the accumulated homogeneity categories (left-hand scale) is presented in diagram 11. A reference line for the index value 100 facilitates the comparison.

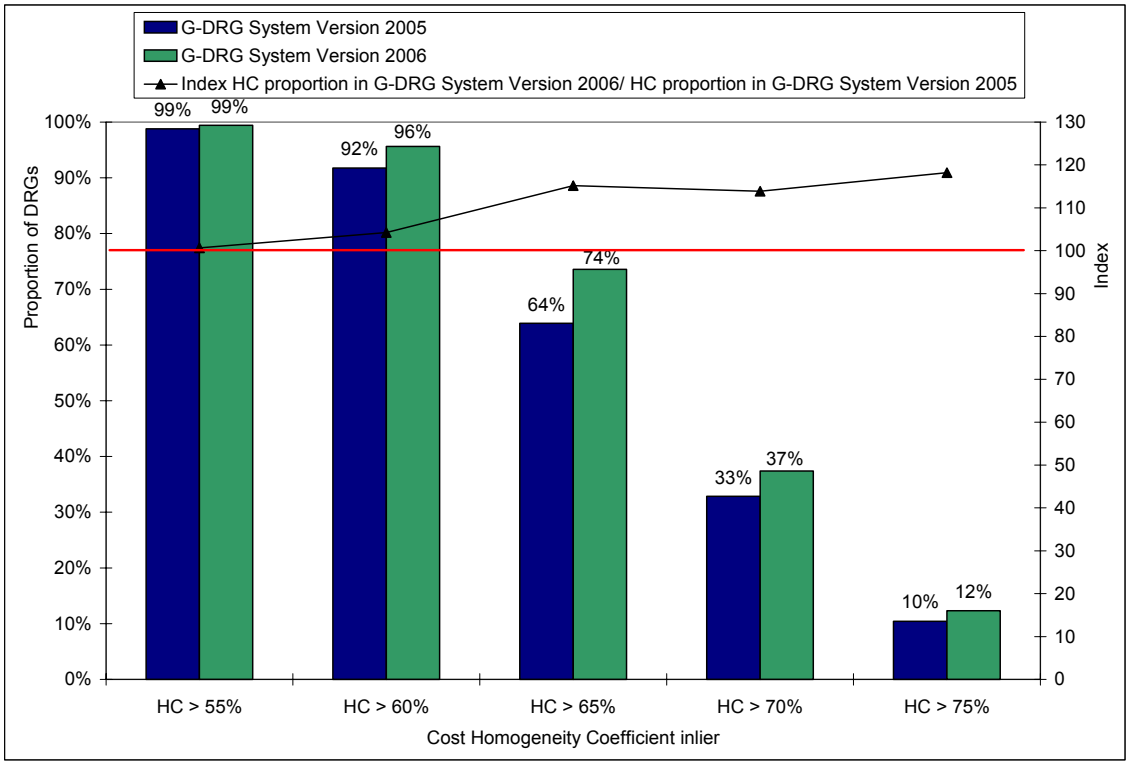

Diagram 11: comparison of the accumulated case-costs homogeneity categories for the 2006 version of the G-DRG and the 2005 version in respect of DRG share, basis: inlier, data from 2004

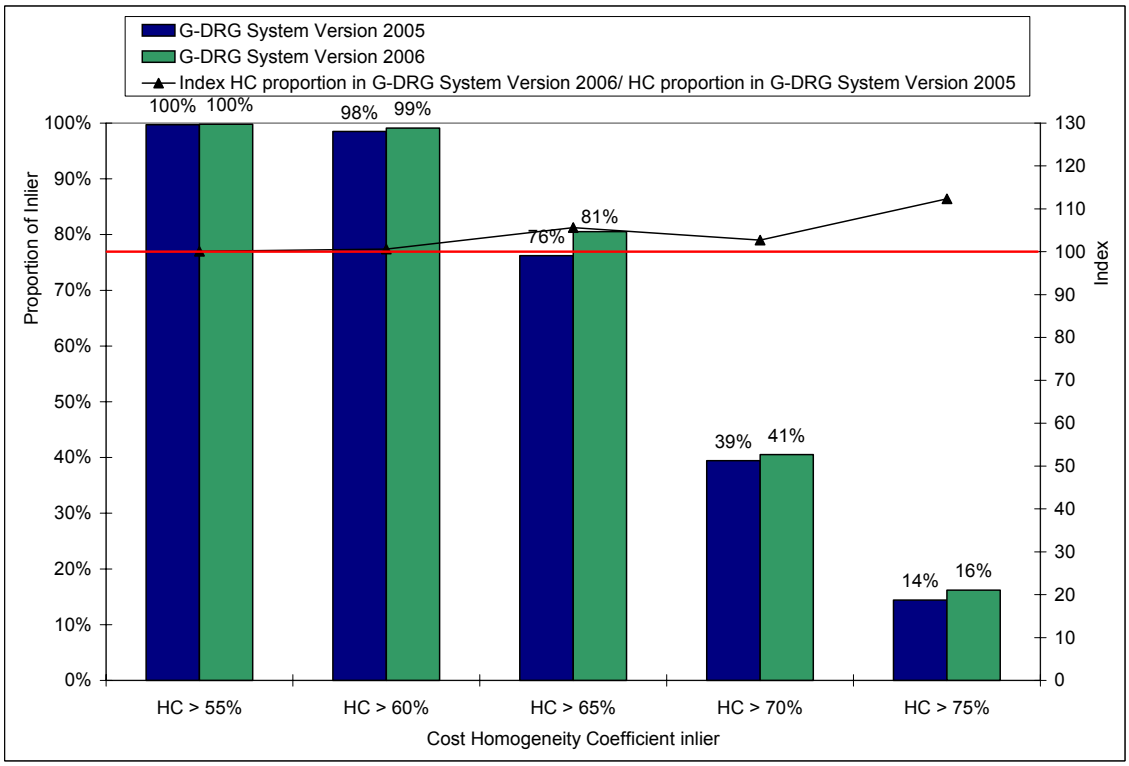

Diagram 12: comparison of the accumulated case cost homogeneity categories for the 2005 version of the G-DRG system and the 2006 version in respect of case share, basis: inlier, data from 2004

The proportion of DRGs (see diagram 11) with a homogeneity coefficient over 70% has risen from 33% to 37% (index 114). In the case of highly cost homogenous DRGs with a homogeneity coefficient of more than 75% the index lies by 118.

Consideration of inlier case share instead of proportion of DRGs in the homogeneity coefficient categories also shows the improvement (see diagram 12). For example, in the case of the 2006 version of the G-DRG system, 41% of all inliers are in highly cost homogenous DRGs with a homogeneity coefficient over 70%.

Analysis of the Confidence Interval of Case Costs

A confidence interval (CI) around the median inlier case cost can be calculated from the statistical identification numbers of a DRG's case costs. This offers a further possibility for examining the homogeneity of case groups. A high proportion of cases with their costs within the parameters of the CI is an indication that this DRG constitutes a cost homogenous case group, and that it realistically reflects the cost situation.

To calculate the 95%-CI around the average case cost of a DRG, the identification numbers of the t-distribution function were used with p = 0.05 and (n–1) degrees of freedom. Hereby, n is the number of inliers of a given DRG.

The DRGs analysed were divided into classes that reflect the proportion depicted. Table 20 displays the proportion of DRGs in the different classes of the DRG systems of 2005 and 2006.

In the 2006 version of the G-DRG System just about 60% of DRGs have 90 to 95% of cases with case costs that lie within the 95%-CI of the median inlier case cost. Only 6% of DRGs have a 95%-CI share of under 85%.

Case Share of 95%-CI Inlier Average Case Cost	G-DRG System Version 2005		G-DRG System Version 2006		Proportion Change
Classification	***No.***	***Share (in %)***	***No.***	***Share (in %)***	***Change (in %)***
Under 80%	21	2.5	17	1.9	-23.9
80 to 85%	59	7.2	37	4.1	- 42.5
85 to 90%	268	32.5	263	29.5	- 9.4
90 to 95%	441	53.4	531	59.5	+ 11.4
95% and more	36	4.4	45	5.0	+ 14.5
Total	**825**		**893**		

Table 20: share of DRGs with case cost within the parameters of the 95% confidence interval of median DRG inlier case costs, basis: 2005 and 2006 versions of G-DRG System, data from 2004

The classes with higher case shares have grown both relatively and absolutely in the 2006 version compared with the 2005 version of the G-DRG System. Diagram 13 shows the data as an accumulation.

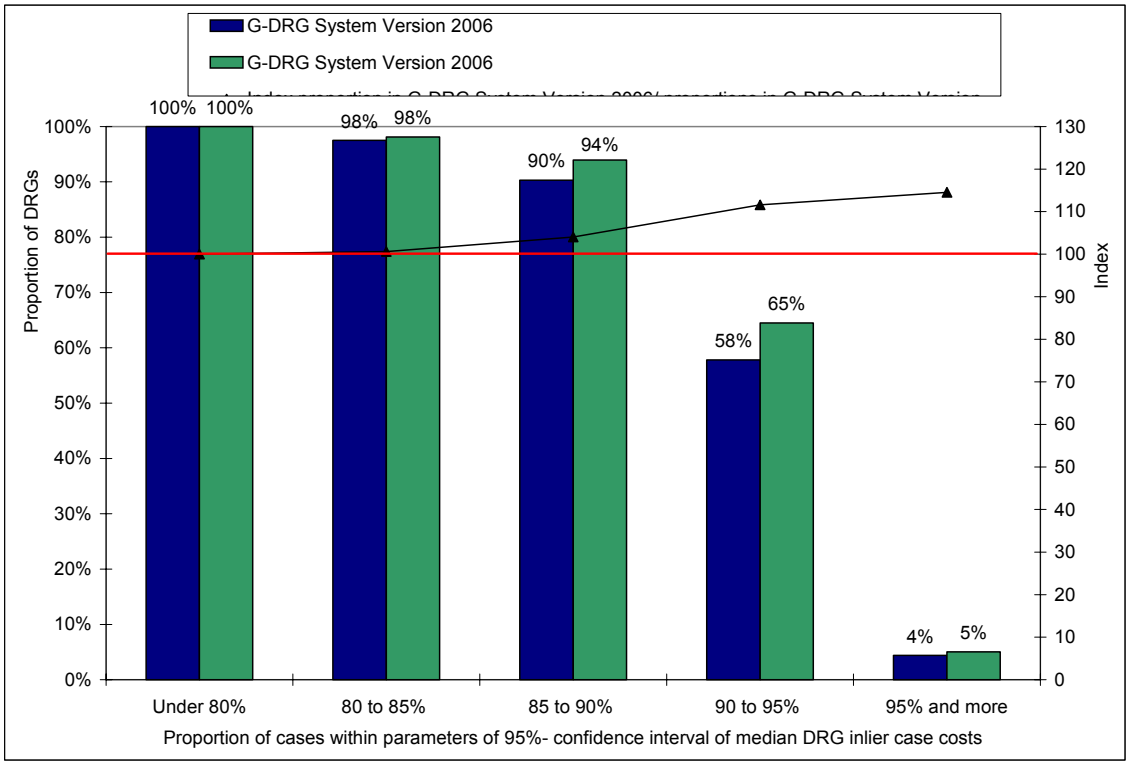

Diagram 13: culmination of DRGs with case costs within the parameters of the 95%-CI of median DRG inlier case cost, basis: 2005 and 2006 versions of G DRG System, data from 2004

It can be seen in the comparison that the proportion of DRGs with more than 90% of cases within the 95%-CI of median inlier case costs has risen discernibly.

These results serve to collectively underline the cost homogeneity of the 2006 version of the G-DRG System.

3.4.4 Checking Length of Stay Representativity

To check the representativity of the calculation hospital data, a comparison between this data and that of the DRG data as per para. 21 KHEntgG was carried out. In both data collections a close look was taken at the inliers of main departments, as defined by the length of stay margins of the 2006 case-based fixed-sum catalogue. Only in the case of certain DRGs were transferral cases also included (see table A-1 of appendix).

A greater degree of detailed plausibility control for the data from calculation hospitals was achieved through differentiated plausibility verification (see ch. 2.1) and the appending inquiries. The plausibility of the approximately 17.7 m. DRG data sets as per para. 21 KHEntgG was also verified by consolidating cases and medical plausibility checks (see ch. 2.1).

With the specified aim of achieving as great cost homogeneity as possible, the representativity verification had to be carried out in both data collections with the help

of cost data; due to incomplete cost information in the DRG data as per para. 21 KHEntgG this was not immediately possible.

Therefore, a helpful step was to choose the length of stay as the parameter for representativity verification. Here a connection to case costs can be generally made – even when not always valid in individual cases.

The relative frequency of DRGs and degree of severity as well as age distribution mean that they, on the contrary, do not provide suitable parameters and were therefore not considered.

An Overview of the Analytical Process

- First of all a **test of goodness of fit** was applied to determine whether the respective length of stay distributions are of normal or lognormal spread.
- **Representativity verification** then followed with a test process without distribution.
- The **difference of length of stay median values analysis** further highlights the practical relevance of the representativity verification.
- Finally, an analysis of the length of stay homogeneity coefficient was carried out providing, with its focus on the statistical spread, a further possibility of analysing the length of stay distribution

A 5% level of significance was set for the statistical analyses.

The following DRGs were not included in the length of stay analysis:

- 17 DRGs with a length of stay of one day (reason: see the introduction to 3.4.3),
- 62 DRGs with less than 30 cases (reason: see section on representativity verification below). This primarily affected DRGs from the pre-MDC (25 DRGs) and MDC 15 *Newborn Infant* (11 DRGs),
- 18 DRGs calculated on the basis of the augmentative data provided by the calculation hospitals (see 3.2.1.2), e.g. intensive care medicine complex treatment, neurological complex treatment (Stroke-Unit). The attributes applied to define these DRGs in the calculation are not included in the DRG data as per para. 21 KHEntgG. An analogy with the calculation data is therefore not possible since the cases of these DRGs cannot be found without the additional attributes provided by the augmentative data provision.

These constraints resulted in an analysis base of 855 DRGs.

Test of Goodness of Fit

Checking for normal and lognormal spread with the help of the Kolmogorov-Smirnov Goodness of Fit Test showed that the empirical distribution of the lengths of stay follows these two distributions in the case of only very few DRGs. The zero hypothesis of a normal distribution could be maintained in only 29 DRGs in the DRG data as per para. 21 KHEntgG and 131 DRGs in the data of the calculation hospitals, which is the equivalent of 3% and 15% respectively (based on 855 DRGs). The quotients for the lognormal distribution test lay by 4% and. 21% respectively

The result of the (symmetrical) normal distribution test was to be expected due to the predominantly right skews of the length of stay spreads; the rates for the – somewhat right skew – lognormal spread displayed, however, similar dimensions.

Representativity Verification

Consequentially the representativity verification in respect of the length of stay was carried out non-parametrically – i.e. without distribution presumption – with the Mann-Whitney Test. This test compares the central tendency of two independent control samples. The Mann-Whitney Test does not use the characteristics of the data themselves, but rather their rankings. Representativity can be assumed when no significant difference can be detected.

The result showed representative length of stay spreads in the case of 446 DRGs (52% based on 855 DRGs). Diagram 14 displays the proportion of DRGs of each MDC for which no significant difference could be detected in the data of the calculation hospitals and the DRG data as per para. 21 KHEntgG with regard to the central tendency:

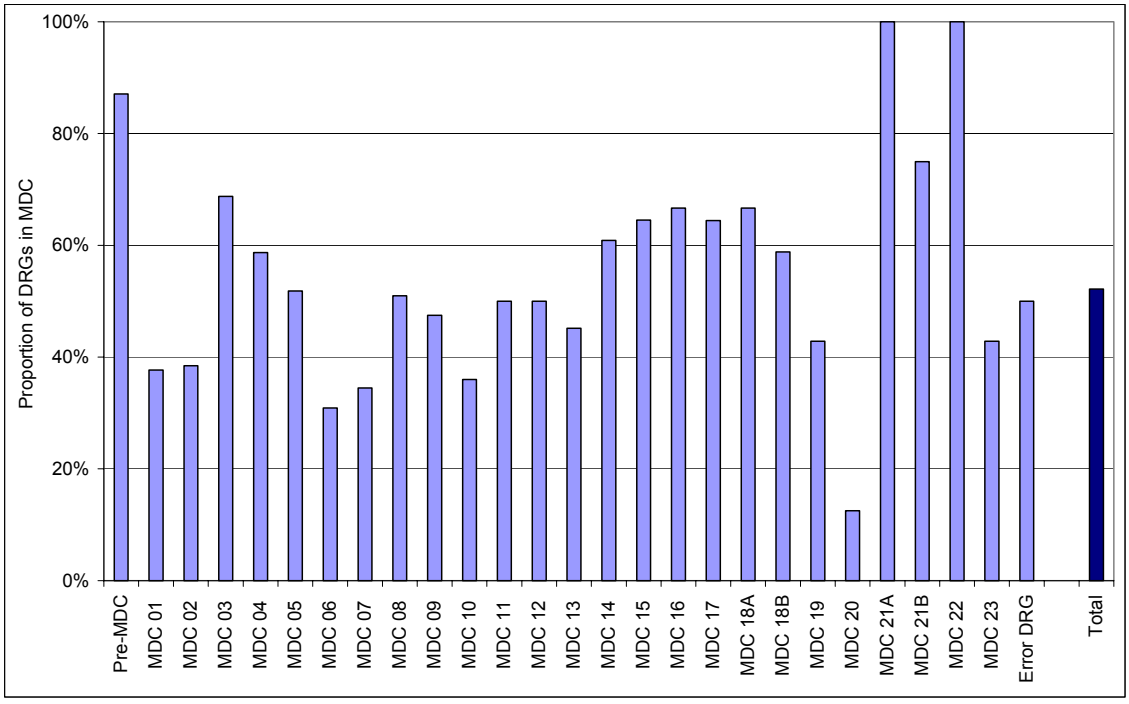

Diagram 14: proportion of Mann Whitney Test non-significant DRGs of each MDC in regards of length of stay spread, inlier, data from 2004

Within the context of the above significance test, the fact that even minor deviations can be the determining factor in the appearance of significant differences in the case of high case numbers is important. The so-called “test power” (the probability that actually existing differences can be revealed by a statistical test) increases i.a. with increasing sample size.

Analysis of the Difference of Length of Stay Median Values

The difference of length of stay median values turns out to be very small in most DRGS: in the case of 584 of the 855 DRGs analysed (68%) it is less than +/-0.5 days,

817 DRGs (96%) display a difference of at most +/-1 day and for 840 DRGs (98%) it amounts to +/-2 days at most when rounded.

Diagram 15 shows clearly that for significantly more than half (61%) the DRGs rated as differing significantly in the Mann-Whitney Test, the rounded difference between the data from the calculation hospitals and the DRG data as per para. 21 KHEntgG amounts to 0 days.

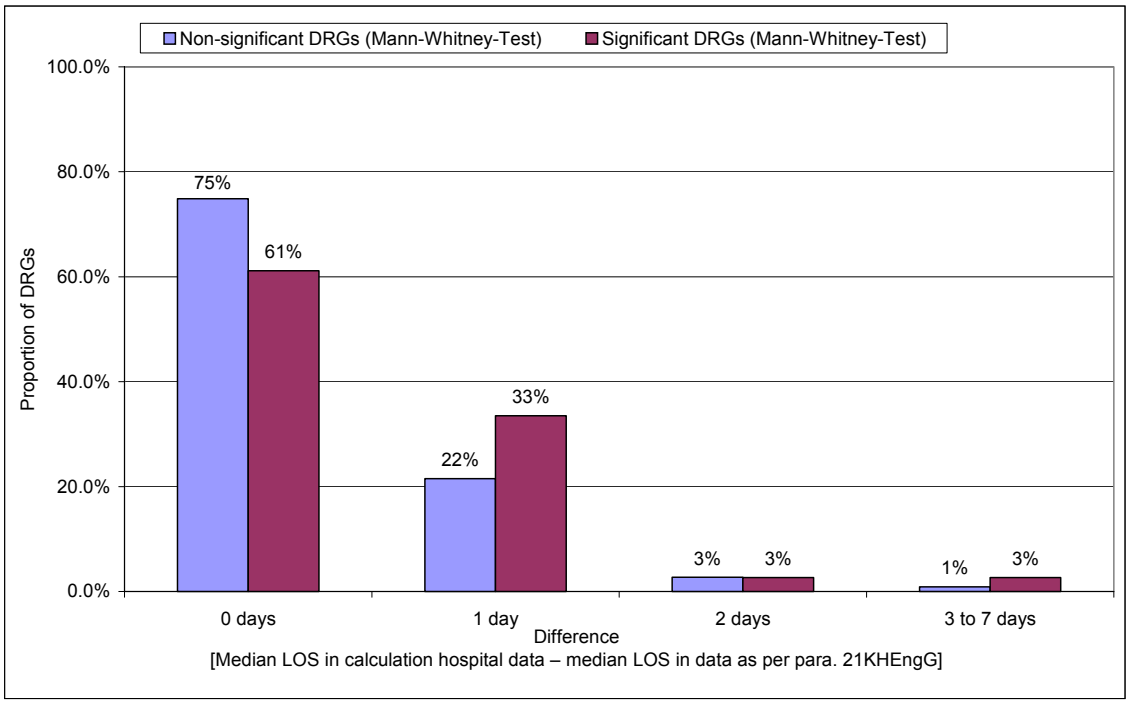

Diagram 15: distribution frequency of the rounded absolute differences in the median values of lengths of stay (data of the calculation hospitals – DRG data as per para. 21 KHEntgG) ´for significant and non-significant DRGs (based on Mann-Whitney Test), Inlier, data from 2004

Despite a representativity quotient of 52% (see section representativity verification), it can be determined, in respect of the practical relevance of the significance test, that in 94% of the DRGs (61% +33%) rated by the Mann-Whitney Test as differing significantly the rounded difference in the median length of stay between the data of the calculation hospitals and the DRG data as per para. 21 KHEntgG amounts to +/-1 day at most.

Taking the 25 analysed DRGs of MDC 10 *endocrinal, dietary and metabolic illnesses* as an example, the following explains the coherence between the results of the representativity verification and the actual differences in median length of stay values.

Diagram 16 displays the difference between the median length of stay values of the data of the calculation hospitals and those of the DRG data as per para. 21 KHEntgG in bar form (left-hand scale). The DRGs are sorted according to an index that reflects the relative difference between the length of stay median values (right-hand scale). A reference line for the index value 100 facilitates the comparison. The DRGs for which the Mann-Whitney Test revealed no significance, i.e. graded as representative in terms of the significance test, are marked on the index line with a circle.

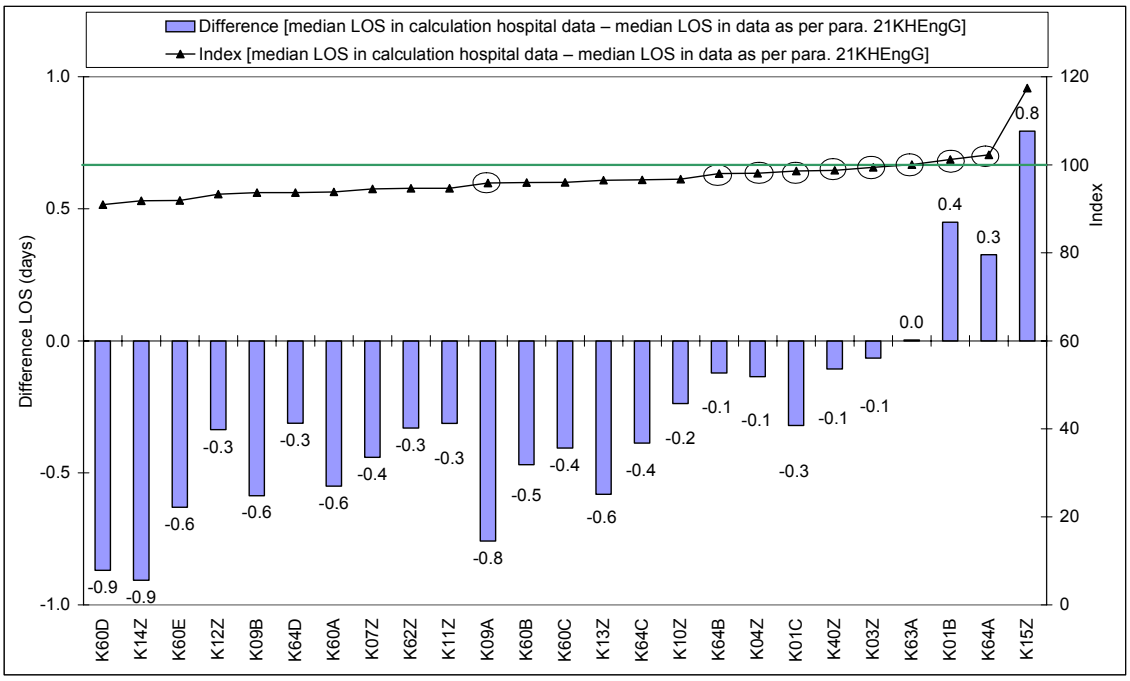

Diagram 16: Differences in median length of stay values for DRGs of MDC 10, sorted according to index, , Inlier, data from 2004

The difference fluctuates in total between -0.9 and +0.8 days. When rounded, eight DRGs display a difference of +/-1 day, for the remaining 17 DRGs this is less than +/- 0.5 days, i.e. 0 days when rounded.

Analysis of Length of Stay Homogeneity Coefficient

A further comparison of length of stay spreads in the data of the calculation hospitals and those of the DRG data as per para. 21 KHEntgG can be achieved by analysing the length of stay spread patterns. To do so, the length of stay homogeneity coefficient (HC_{LOS}) can be used.

When the DRGs are classified according to the inlier HC_{LOS}, the result is the empirical spread frequency of homogeneity class as displayed in diagram 17. The frequency spread of length of stay homogeneity coefficients is almost identical in the data of the calculation hospitals and in the DRG data as per para. 21 KHEntgG.

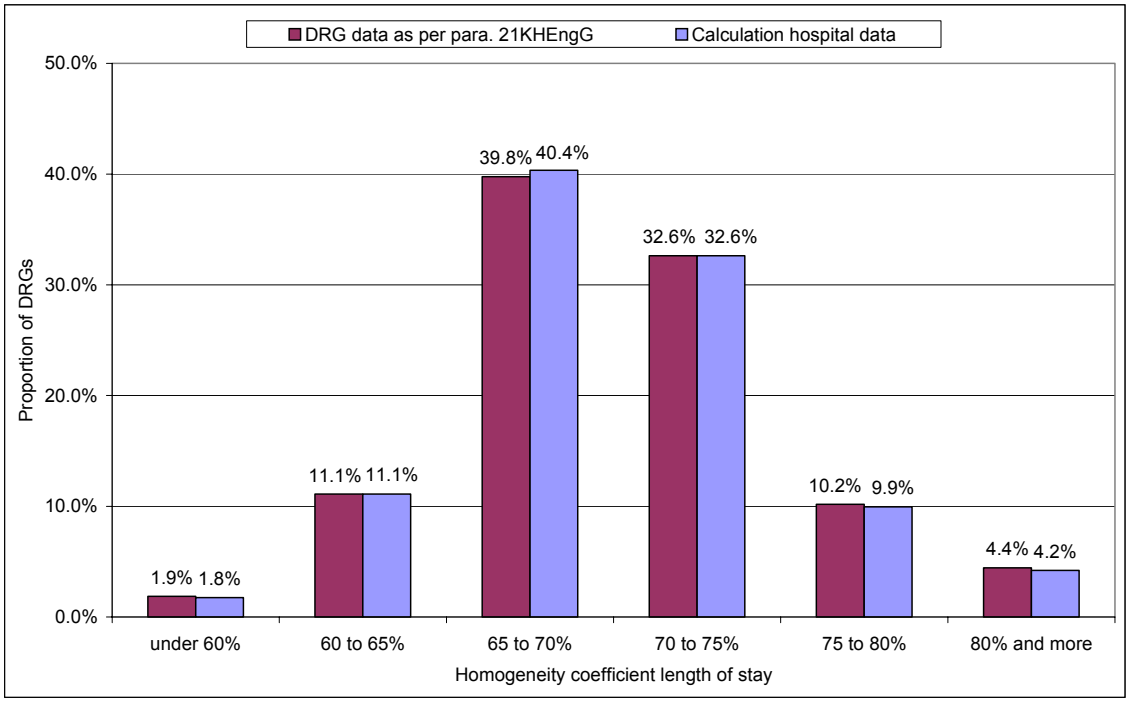

Diagram 17: frequency spread of length of stay homogeneity coefficient classes in the data of the calculation hospitals and in the DRG data as per para. 21 KHEntgG, Inlier, data from 2004

The relation of Length of stay homogeneity coefficients to one another can be described with an index. Diagram 18 shows this index for the 855 DRGs analysed in sorted form.

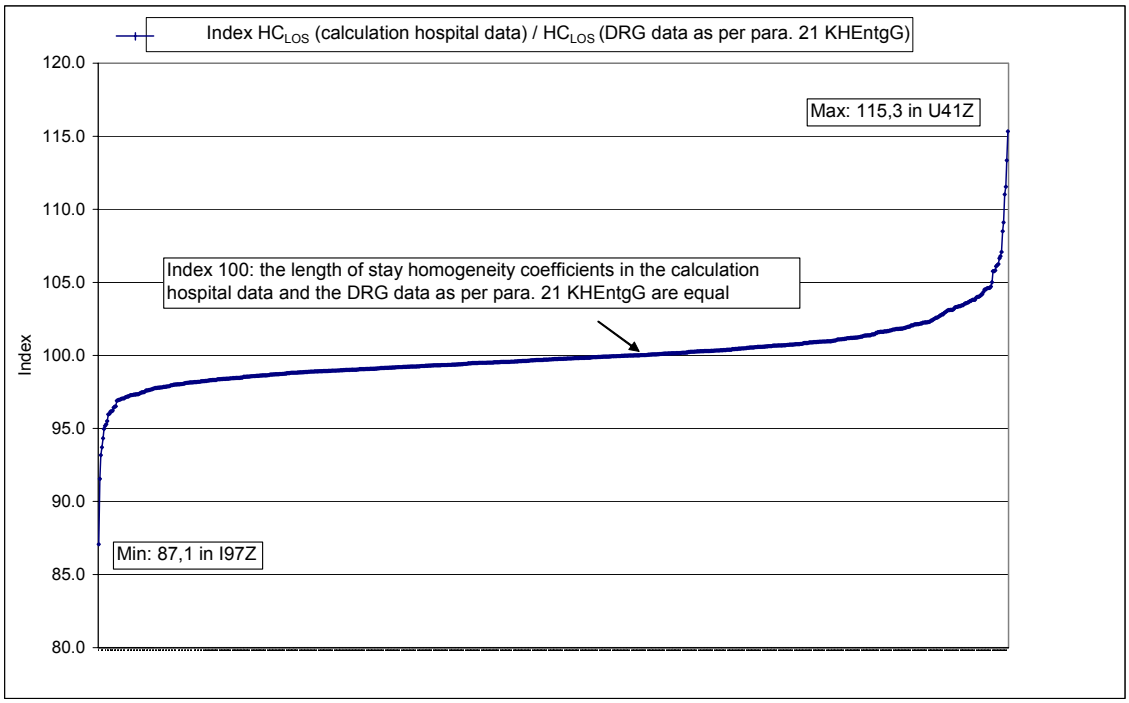

Diagram 18: Index HC_{LOS} (data of the calculation hospitals) / HC_{LOS} (DRG data as per para. 21 KHEntgG), sorted, Inlier, data from 2004

Overall, a very high degree of congruency is shown. For 835 of 855 DRGs (98%) the index lies between 95 and 105 (i.e. the relative deviation between the data of the calculation hospitals and that of the DRG data as per para.21 KHEntgG amounts, at most, to +/-5%). With regard to the results displayed in diagrams 17 and 18, one can speak of a high degree of congruency in length of stay homogeneity coefficients.

Conclusions

1. As expected, the empirical length of stay distribution follows a normal or lognormal spread only to a small degree.
2. Analysis of length of stay, used as an alternative parameter for testing the representativity of the cost homogeneity, showed for the majority of the 855 DRGs analysed only a very small difference between the median length of stays in the data of the calculation hospitals and those of the DRG data as per para. 21 KHEntgG.
3. Analysis of length of stay homogeneity coefficients that focuses more on the spread and therefore on the homogeneity of distribution shows no significant distinctiveness between the data of the calculation hospitals and that of the DRG data as per para. 21 KHEntgG.
4. The length of stay homogeneity coefficients of the data of the calculation hospitals and of the DRG data as per para. 21 KHEntgG, combined with examination of deviation in length of stay median value in both groups, show that
    a) Plausibility checks have created no so-called “pseudo-homogeneity” in the data which serves as the basis for developing the G-DRG classifications, and
    b) the spread dimensions on which the evaluation of G-DRG classification development is based, could at least form a feasible basis for reflecting DRG data as per para. 21 KHEntgG.

The 2006 version of the G-DRG system developed on the basis of the data of the calculation hospitals also reflects well the DRG data as per para. 21 KHEntgG in respect of cost and length of stay homogeneity.

4 Development Perspectives

Since 2004, the G-DRG system has been actively applied country-wide to the accounting procedure between hospitals and health insurance funds. All those participating gain experience with the G-DRG system that can be applied constructively in the maintenance and development of the system, for example within the scope of the recommendation procedure. Thematic points for the future development of the G-DRG system have already arisen from the 2006 update of the case-based fixed-sum catalogue. They deserve special attention and are briefly addressed in the following paragraphs.

Reimbursement of Day-patient Services

The 2006 case-based fixed-sum catalogue contains only two reimbursements for day-patient services. First of all, early developments in this area require a consensus on the definition of day-patient cases of treatment. In addition, the data basis will have to be standardised by precise specification in the data provision obligation as per para 21 KHEntgG for all hospitals. Thereby, a retroactive fragmentation of accounting data sets to fulfil the obligation of providing data must, however, be avoided. The calculation specifications for day-patient services should be formulated even more stringently, so that plausibility and conformity checks to support data quality can be suitably applied.

Cost Weights in Cases of Treatment by Attending Physicians

Around a third more data sets compared to the preceding year were available as a basis for calculating the 2006 catalogue. 54 DRGs for treatment by attending physicians could be independently calculated due to improved plausibility verification. This course should be continued intensely; for example by a reinforced orientation of plausibility verification on the content conformity of the data sets.

Data Collation/Plausibility verification

The calculation hospitals have the specifications of the calculation handbook better implemented than in previous years not least due to the fixed-sum remuneration for participation in the calculation associated with data quality. Plausibility verification keeps apace with the development in calculation specifications and is adapted annually to meet the increased demands posed by calculation. At the same time, it thereby becomes apparent that even further efforts to further improve the data quality are possible on the part of the calculation hospitals. This applies to both the adherence to the German Encoding Guidelines as well as the handbook-conform calculation of case costs. In this, special attention will be paid to the coherence of calculation data set content, to further increase the data quality. The plausibility and conformity verification will be continuously extended accordingly.

Calculation Methodology

The allocation of the individual costs of especially expensive material will be improved further on the basis of tightened calculation specifications. This happens when, i.a., appendix 10 of the calculation handbook strictly specifies the mandatory allocation of individual costs. Furthermore, the “Clinical Allocation Models“ (*Klinischen Verteilungsmodelle* – KVM) will be subject to even more rigorous checking criteria in the next calculation round to ensure a causally correct cost allocation where registration of individual costs is missing. The share of case costs in the infrastructure costs varies within the calculation control sample. The in part considerable variation in

the case cost share of the infrastructure costs can not always be explained plausibly. The cost allocation of the medical and especially the non-medical infrastructure therefore constitutes a major point in the further development of the calculation methodology, with the aim of specifying mandatory distribution criteria for the largest blocks of costs.

Closing the Innovation Gap (OPS Catalogue – Calculation Gap)

The so-called “innovation gap“ was reduced considerably for the first time with the 2005 update of the G-DRG system, since the calculation of 2004 was in part based on the service differentiation of the 2004 version of OPS 301 or codes not yet included in the 2004 version of OPS 301. The 2005 calculation also resorted to the common procedure of augmentative data compilation and polled service differentiations from the 2005 ICD-10-GM and the 2005 OPS version that were not yet available in the data from 2004. Normally, this information could only have been taken into account in the calculation of 2006 – or after introducing new codes for 2006 – in 2007 at the earliest.

Augmentative polling has also proved this year to be an effective instrument for considerably shortening the time span between identifying a new procedure, introducing a respective OPS code and inclusion in the calculation. The development of the G-DRG system is thereby provided with a process that enables a cost-equitable reimbursement of an innovative procedure in real-time. Especially establishments that provide a maximal range of treatment can profit from this. The task of substantiating the reasoning presented within the framework of the NUB process on the basis of actual calculation data remains unchanged.

Appendix

Table A-1:

DRG case groups by which transferred cases are considered in the calculation of cost weight (see ch. 2.2)

DRG	DRG Text
A01C	Liver transplantation without artificial respiration >59 hours, without transplant rejection
A03A	Lung transplantation with artificial respiration >179 hours
A03B	Lung transplantation with artificial respiration >47 and <180 hours
A03C	Lung transplantation without artificial respiration >47 hours
A04D	Bone marrow transplantation/stem cell transfusion, allogenic, without in-vitro preparation, except for plasmacytoma, HLA-identical
A05A	Heart transplantation with artificial respiration >179 hours
A06A	Artificial respiration >1,799 hours with complex OR procedure or polytrauma, with highly complex operation or complex intensive care medical treatment >3,680 outlay points
A06B	Artificial respiration >1,799 hours with complex OR procedure or polytrauma without highly complex operation, without complex intensive care medical treatment >3,680 points or without complex OR procedure, without polytrauma with complex intensive care treatment >3,680 points or aged <16 years
A07B	Artificial respiration >999 and <1,800 hours with complex OR procedure, without highly complex operation, without complex intensive care medical treatment >3,680 outlay points, with polytrauma or complicating procedures
A07C	Artificial respiration >999 and <1,800 hours without polytrauma, with complex OR procedure, without highly complex operation, without complicating procedures, without complex intensive care medical treatment >3,680 points or without complex OR procedure with comp. int. treatment >2,208 points
A07D	Artificial respiration >999 and <1,800 hours without complex OR procedure, without polytrauma, without complex intensive care medical treatment >2,208 outlay points
A09C	Artificial respiration >499 and <1,000 hours without complex OR procedure, without polytrauma, with complicating procedures
A09D	Artificial respiration >499 and <1,000 hours without complex OR procedure, without polytrauma, without complicating procedures
A11D	Artificial respiration >249 and <500 hours without complex OR procedure, without polytrauma, with defined OR procedure or complicating procedures
A11E	Artificial respiration >249 and <500 hours without complex OR procedure, without polytrauma, without defined OR procedure, without complicating procedures
A13B	Artificial respiration >95 and <250 hours with complex OR procedure, without highly complex intervention, without intensive care medicine complex treatment >1,104 points
A13C	Artificial respiration >95 and <250 hours without complex OR procedure, with specific OR procedure and complicating procedures, without intensive care medicine complex treatment >1,104 points

DRG	DRG Text
A13D	Artificial respiration >95 and <250 hours without complex OR procedure, with specific OR procedure or complicating procedures or age <16 years
A13E	Artificial respiration >95 and <250 hours without complex OR procedure without specific OR procedure, without complicating procedures, age >15 years
A15C	Bone marrow transplantation/stem cell transfusion, autogenous, age >17 years, without in vitro preparation
A17B	Kidney transplantation without post operative failure of the transplanted kidney
A18Z	Artificial respiration >999 hours and transplantation of liver, lung, heart and bone marrow or stem cell transfusion
A42A	Stem cell removal in the case of self-donor with chemotherapy
A42B	Stem cell removal in the case of self-donor without chemotherapy
A60A	Failure and rejection of a transplanted organ, length of stay more than one day, with extremely difficult CC
A60B	Failure and rejection of a transplanted organ, length of stay more than one day, without extremely difficult CC
A60C	Failure and rejection of a transplanted organ, length of stay more than one day
A63Z	Evaluation stay prior to lung or heart-lung transplantation
A64Z	Evaluation stay prior to liver or kidney-pancreas transplantation
B02B	Complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, without radiotherapy more than 8 sessions, age <6 years or age <18 years with major intracranial intervention
B71A	Ailments of the cerebral nerves and peripheral nerves with complex diagnosis, with extremely difficult CC or in the case of para-/tetraplegy with extremely difficult or difficult CC
B83A	Apoplexy with artificial respiration >499 hours
D02B	Complex resections with reconstructions to the head and throat without complex operation
E03Z	Brachytherapy or therapy with radiological nuclides in the case of illnesses and disorders of the respiratory organs, length of stay more then one day
E08A	radiotherapy in the case of illnesses and disorders of the respiratory organs with operative intervention or artificial respiration >24 hours
E62A	Complex infections and inflammations of the respiratory organs with complicating procedures or with complex diagnosis following an organ transplantation
E75A	Other illnesses of the respiratory organs with extremely difficult CC, age <10 years
F01B	New implantation cardioverter/defibrillator (AICD), bicameral stimulation, with additional heart or vascular intervention
F09Z	Other cardiothoracic operations without heart-lung machine, with complicating procedures or age <3 years
F35B	Other cardiothoracic operations without heart-lung machine, without complicating procedures, age >9 years, without extremely difficult CC
F97Z	Intensive care medicine complex treatment >1,104 points in the case of illnesses and disorders of the circulatory system with specific procedure

DRG	DRG Text
G01Z	Evisceration of the lesser pelvis
G14Z	Geriatric early rehabilitative complex treatment with specific OR procedure in the case of illnesses and disorders of the digestive organs
H15Z	Radiotherapy in the case of illnesses and disorders of the hepatobiliary system and pancreas, length of stay more than one day, more than 9 session
I11Z	Operations to extend an extremity
J01Z	Tissue transplantation with microvascular anastomosation in the case of ailments of the skin, subcutis and mamma
J08A	Other skin transplantation or debridement with complex diagnosis, with additional intervention on the head and throat or extremely difficult CC, with complex procedure
J61C	Serious afflictions of the skin, length of stay more than one day, age <18 years
L69A	Other serious afflictions of the urinary organs, length of stay more than one day, with extremely difficult or difficult CC, age <10 years
L72A	Thrombotic microangiopathy
O01A	Caesarean section with multiple complicating diagnoses, length of pregnancy up to 25 complete weeks
O65A	Other prenatal inpatient admissions with intrauterine therapy of the foetus
P01Z	Newborn infant, death <5 days after admission with significant OR procedure
P04A	Newborn infant, admission weight 1500–1999 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 hours
P05A	Newborn infant, admission weight 2000–2499 g, with multiple serious complications, with artificial respiration >120 hours
P06A	Newborn infant, Admission weight >2499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 hours
P60B	Newborn infant, transferred <5 days after admission without significant OR procedure, referred
P60C	Newborn infant, transferred <5 days after admission without significant OR procedure, not referred
P61E	Newborn infant, admission weight <750 g, death <29 days after admission
P62E	Newborn infant, admission weight 750–999 g, death <29 days after admission
P65D	Newborn infant, admission weight 1500–1999 g without significant OR procedure, without artificial respiration >95 hours, without complication
Q02B	Various OR procedures in the case of illnesses of the blood, the blood producing organs and the immune system, without extremely difficult CC, age < 6 years
Q03A	Small operations in the case of illnesses of the blood, the blood producing organs and the immune system, age <10 years
R01A	Lymphoma and Leukaemia with extensive OR-procedures, with extremely difficult CC, with complex OR procedure
R16Z	Highly complex chemotherapy with operative intervention in cases of haematological and solid tumours
R60A	Acute myeloid leukaemia with highly complex chemotherapy
R61C	Lymphoma and non-acute leukaemia, with dialysis

DRG	DRG Text
R63A	Other acute Leukaemia with highly complex chemotherapy, with dialysis or sepsis or with agranulocytosis or port implantation or with extremely difficult CC
R63D	Other acute leukaemia with intensive or moderately complex chemotherapy, without dialysis, without sepsis, without agranulocytosis, without port implantation, with extremely difficult CC
R63E	Other acute leukaemia with local chemotherapy, with dialysis or sepsis or with agranulocytosis or port implantation or with extremely difficult CC
S63A	Infection in case of HIV illness with complex diagnosis and extremely difficult CC
S65A	Other afflictions in case of HIV illness with heart attack or chronic ischemic heart disease or extremely difficult CC
T61A	Post operative and post traumatic infections with complicating procedures or complicating diagnosis
W01B	Polytrauma with artificial respiration or craniotomy, without early rehabilitation, with artificial respiration >263 hours
W02A	Polytrauma with operations on the hip joint, Femur, extremities and spinal column with complicating procedures or operations on multiple sites.
901A	Extensive OR procedure without reference to the main diagnose with complicating procedures or radiotherapy
901C	Extensive OR procedure without reference to the main diagnose without complicating procedures, without radiotherapy, without complex OR-procedure, with other operations to the head and spinal column
963Z	Neonatal diagnosis incommensurate with age or weight

Table A-2:
DRGs, for which the modified form of analytical derivation or the median daily longlier cost has been used to calculate supplementary remuneration (see ch. 2.4)

DRG	DRG Text
A01A	Liver transplantation with artificial respiration >179 hours
A01B	Liver transplantation with artificial respiration >59 and <180 hours or with transplant rejection
A01C	Liver transplantation without artificial respiration >59 hours, without transplant rejection
A02A	Transplantation of kidneys and pancreas with transplant rejection
A02B	Transplantation of kidneys and pancreas without transplant rejection
A03A	Lung transplantation with artificial respiration >179 hours
A03B	Lung transplantation with artificial respiration >47 and <180 hours
A03C	Lung transplantation without artificial respiration >47 hours
A04A	Bone marrow transplantation / stem cell transfusion, allogeneic, with in vitro preparation, HLA-different
A04B	Bone marrow transplantation / stem cell transfusion, allogeneic, with in vitro preparation, HLA-identical
A04C	Bone marrow transplantation / stem cell transfusion, allogeneic, without in vitro preparation, except in the case of plasmacytoma, HLA-different
A04D	Bone marrow transplantation / stem cell transfusion, allogeneic, without in vitro preparation, except in the case of plasmacytoma, HLA-identical
A04E	Bone marrow transplantation / stem cell transfusion, allogeneic, without in vitro preparation, in the case of plasmacytoma
A05A	Heart transplantation with artificial respiration >179 hours
A05B	Heart transplantation without artificial respiration >179 hours
A06A	Artificial respiration >1,799 hours with complex OR procedure or polytrauma, with highly complex operation or intensive care medicine complex treatment >3,680 points
A06B	Artificial respiration >1,799 hours with complex OR procedure or polytrauma, without highly complex operation, without intensive care medicine complex treatment >3,680 points or without complex OR procedure, without polytrauma, with int. med. comp. tr. >3,680 points, or age <16 years
A06C	Artificial respiration >1,799 hours without complex OR procedure, without polytrauma, without intensive care medicine complex treatment >3,680 points, age >15 years
A07A	Artificial respiration >999 and <1,800 hours with complex OR procedure or polytrauma, with highly complex operation or intensive care medicine complex treatment >3,680 points
A07B	Artificial respiration >999 and <1,800 hours with complex OR procedure, without highly complex operation, without intensive care medicine complex treatment >3.680 points, with polytrauma or complicating procedures
A07C	Artificial respiration >999 and <1,800 hours without polytrauma, with complex OR procedure, without highly complex operation, without complicating procedures, without intensive care medicine complex treatment >3,680 points or without complex OR procedure, with int. med. comp. tr. >2,208 points

DRG	DRG Text
A07D	Artificial respiration >999 and <1,800 hours without complex OR procedure, without polytrauma, without intensive care medicine complex treatment >2,208 points
A09A	Artificial respiration >499 and <1,000 hours with complex OR procedure or polytrauma, with highly complex surgical operation or age <16 years
A09B	Artificial respiration >499 and <1,000 hours with complex OR procedure or polytrauma, without highly complex surgical operation, age >15 years
A09C	Artificial respiration >499 and <1,000 hours without complex OR procedure, without polytrauma, with complicating procedures
A11A	Artificial respiration >249 and <500 hours with highly complex operation or intensive care medicine complex treatment >1,656 points or without complex OR procedure, with specific OR procedure and complicating procedures, with intensive care medicine complex treatment >1,656 points
A11B	Artificial respiration >249 and <500 hours with complex OR procedure, without highly complex operation, without intensive care medicine complex treatment >1,656 points
A11C	Artificial respiration >249 and <500 hours without complex OR procedure, with specific OR procedure and complicating procedures, without intensive care medicine complex treatment >1,656 points
A13A	Artificial respiration >95 and <250 hours with highly complex operation or intensive care medicine complex treatment >1,104 points or without complex OR procedure, with specific OR procedure and complicating procedures, with intensive care medicine complex treatment >1,104 points
A13B	Artificial respiration >95 and <250 hours with complex OR procedure, without highly complex operation, without intensive care medicine complex treatment >1,104 points
A13C	Artificial respiration >95 and <250 hours without complex OR procedure, with specific OR procedure and complicating procedures, without intensive care medicine complex treatment >1,104 points
A15A	Bone marrow transplantation / stem cell transfusion, autogenous, age <18 years, with in vitro preparation
A15B	Bone marrow transplantation / stem cell transfusion, autogenous, age <18 years or with in vitro preparation
A15C	Bone marrow transplantation / stem cell transfusion, autogenous, age >17 years, without in vitro preparation
A15D	Bone marrow transplantation / stem cell transfusion, autogenous, in the case of tumour of uncertain behaviour, lymphoma or malignant testicular or ovarian tumours
A15E	Bone marrow transplantation / stem cell transfusion, autogenous, in the case of plasmacytoma
A17A	Kidney transplantation with post operative failure of the kidney transplant
A17B	Kidney transplantation without post operative failure of the kidney transplant
A18Z	Artificial respiration >999 hours and transplantation of liver, lung, heart and bone marrow or stem cell transfusion
A42A	Stem cell extraction in the case of self-donor with chemotherapy
A42B	Stem cell extraction in the case of self-donor without chemotherapy
A60A	Failure and rejection of a transplanted organ, length of stay of more than one day, with extremely difficult CC

DRG	DRG Text
A60B	Failure and rejection of a transplanted organ, length of stay of more than one day, without extremely difficult CC
A60C	Failure and rejection of a transplanted organ, length of stay of one day
B02A	complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, with radiotherapy, more than 8 sessions
B02B	Complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, without radiotherapy of more than 8 sessions, age <6 years or age <18 years with major intracranial operation
B02C	Complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, with radiotherapy, less than 9 sessions
B02D	Complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, without radiotherapy, age >17 years, with major intracranial operation
B02E	Complex craniotomy or spinal operation or other elaborate operation on the nervous system with artificial respiration >95 hours, without radiotherapy, age >17 years, without major intracranial operation
B03Z	Operative operation in the case of non-acute para-/tetraplegy or operation on the spine and spinal cord in the case of malignant tumour or with difficult CC or operation in the case of cerebral paralysis, muscular dystrophy, neuropathy with extremely difficult CC
B14Z	Moderately complex craniotomy
B15Z	Radiotherapy in the case of illnesses and disorders of the nervous system, length of stay more than one day, more than 10 sessions
B16Z	Radiotherapy in the case of illnesses and disorders of the nervous system, length of stay more than one day, less than 11 sessions
B20Z	Craniotomy or major spinal operation
C02A	Enucleations and operations on the orbita in the case of malignant tumour and radiotherapy in the case of malignant tumour
C04A	Cornea transplantation with extra capsular cataract extraction (ECCE)
C04B	Cornea transplantation without extra capsular cataract extraction (ECCE)
D02A	Complex resections with reconstructions on the head and throat with complex operation
D02B	Complex resections with reconstructions on the head and throat without complex operation
D08Z	operation to the oral cavity and mouth in the case of malignant tumour
D09Z	Tonsillectomy in the case of malignant tumour or various operations on the ear, nose, mouth and throat with extremely difficult CC
D18Z	Radiotherapy with operative intervention in the case of illnesses and disorders of the ear, nose, mouth and throat
D19Z	Radiotherapy with in the case of illnesses and disorders of the ear, nose, mouth and throat, length of stay more than one day, more than 10 sessions
D20A	Other radiotherapy in the case of illnesses and disorders of the ear, nose, mouth and throat, length of stay more than one day, age >70 years or with extremely difficult CC

DRG	DRG Text
D20B	Other radiotherapy in the case of illnesses and disorders of the ear, nose, mouth and throat, length of stay more than one day, age <70 years, without extremely difficult CC
D25A	Moderately complex operations on the head and throat in the case of malignant tumour
D28Z	Monognathic osteotomy and complex operations on the head and throat in the case of malignant tumours
D35Z	operations on the nose and paranasal sinuses in the case of malignant tumour
D60A	Malignant tumours of the ear, nose, mouth and throat, length of stay more than one day, with extremely difficult or difficult CC
D60B	Malignant tumours of the ear, nose, mouth and throat, length of stay one or without extremely difficult or difficult CC
E60Z	Cystic fibrosis (mucoviscidosis)
F03Z	Operation on the heart valves with heart-lung machine, with complicating procedures
F04Z	Operation on the heart valves with heart-lung machine, triple intervention or age <1 year or operation in deep hypothermia
F05Z	Coronary bypass operation with invasive diagnostic cardiology, with complicating procedures or carotis intervention
F06Z	Coronary bypass operation without invasive diagnostic cardiology, with complicating procedures or carotis intervention
F07Z	Other surgical operations with heart-lung machine, age <1 year or with complicating procedures or complex operation
F11A	Operation on the heart valves with heart-lung machine, ambilateral operation or in the case of congenital heart defect, with reoperation or invasive diagnostics
F11B	Operation on the heart valves with heart-lung machine, ambilateral intervention or in the case of congenital heart defect, or with reoperation or invasive diagnostics
F16Z	Coronary bypass operation with invasive diagnostic cardiology, without complicating procedures, without carotis intervention, with reoperation or infarct
F22Z	Other operation on the heart valves with heart-lung machine
F23Z	Coronary bypass operation with invasive diagnostic cardiology, without complicating procedures, without carotis intervention, without reoperation, without infarct
F30Z	Operation in the case of complex congenital heart defect
F31Z	Other operations with heart-lung machine, age >0 years, without complicating procedures, without complex operation
F32Z	Coronary bypass operation without invasive diagnostic cardiology, without complicating procedures, without carotis intervention
G15Z	Radiotherapy with major surgical operation on the abdomen
G27A	Radiotherapy in the case of illnesses and disorders of the digestive organs, length of stay more than one day, more than 8 sessions, with extremely difficult CC
G27B	Radiotherapy in the case of illnesses and disorders of the digestive organs, length of stay more than one day, more than 8 sessions, without extremely difficult CC

DRG	DRG Text
G29A	other radiotherapy in the case of illnesses and disorders of the digestive organs, length of stay more than one day, with extremely difficult CC
G29B	other radiotherapy in the case of illnesses and disorders of the digestive organs, length of stay more than one day, without extremely difficult CC
H01Z	Operations on the pancreas and liver and portosystemic Shunt operations with major intervention or radiotherapy
H15Z	Radiotherapy in the case of illnesses and disorders of the hepatobiliary system and pancreas, length of stay more than one day, more than 9 sessions
H16Z	Other radiotherapy in the case of illnesses and disorders of the hepatobiliary system and pancreas, length of stay more than one day
I39Z	Radiotherapy in the case of illnesses and disorders of the musco-skeletal system and connective tissues, more than 8 sessions
I54Z	Radiotherapy in the case of illnesses and disorders of the musco-skeletal system and connective tissues, less than 9 sessions
J17Z	Radiotherapy in the case of illnesses and disorders of the skin, subcutis and mamma, length of stay more than one day, more than 9 sessions
J18Z	Other radiotherapy in the case of illnesses and disorders of the skin, subcutis and mamma, length of stay more than one day
J61A	Serious skin afflictions, length of stay more than one day, age >17 years with extremely difficult CC or pressure sores in the case of para-/tetraplegy
K03Z	Operations on the adrenal gland in the case of malignant tumour or operations on the pituitary gland
K15Z	Radiotherapy in the case of endocrinal, dietary and metabolic illnesses, length of stay more than one day
L03Z	kidney, ureter and major urinary bladder operations in the case of tumour, age <19 years or with extremely difficult CC or except in the case of tumour, with extremely difficult CC
L12Z	Radiotherapy in the case of illnesses and disorders of the urinary organs, length of stay more than one day
L72B	Haemolytic uraemic syndrome
M10Z	Radiotherapy in the case of illnesses and disorders of the male sexual organs, length of stay more than one day
N15Z	Radiotherapy in the case of illnesses and disorders of the female sexual organs, length of stay more than one day, more than 9 sessions
N16Z	Radiotherapy in the case of illnesses and disorders of the female sexual organs, length of stay more than one day, less than 10 sessions
O01A	Caesarean section with multiple complicating diagnoses, length of pregnancy up to 25 full weeks
O01B	Caesarean section without multiple complicating diagnoses, length of pregnancy between 26 and 33 full weeks or with complicating diagnose, length of pregnancy up to 25 full weeks
O60A	Vaginal delivery with multiple complicating diagnoses, at least one serious, length of pregnancy up to 33 full weeks
P01Z	Newborn infant, death <5 days after admission with significant OR procedure
P02A	Cardiothoracic or vascular operations in the case of newborn infant with artificial respiration >143 hours

DRG	DRG Text
P02B	Cardiothoracic or vascular operations in the case of newborn infant without artificial respiration >143 hours
P03A	Newborn infant, admission weight 1000–1499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >479 hours
P03B	Newborn infant, admission weight 1000–1499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 and <480 hours
P03C	Newborn infant, admission weight 1000–1499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, without artificial respiration >120 hours or without multiple serious complications
P04A	Newborn infant, admission weight 1500–1999 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 hours
P04B	Newborn infant, admission weight 1500–1999 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 hours
P04C	Newborn infant, admission weight 1500–1999 g with significant OR procedure or artificial respiration >95 hours, without multiple serious complications
P05A	Newborn infant, admission weight 2000–2499 g, with multiple serious complications, artificial respiration >120 hours
P05B	Newborn infant, admission weight 2000–2499 g, with multiple serious complications, without artificial respiration >120 hours
P05C	Newborn infant, admission weight 2000–2499 g, without multiple serious complications
P06A	Newborn infant, admission weight >2499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, with artificial respiration >120 hours
P06B	Newborn infant, admission weight >2499 g with significant OR procedure or artificial respiration >95 hours, with multiple serious complications, without artificial respiration >120 hours
P06C	Newborn infant, admission weight >2499 g with significant OR procedure or artificial respiration >95 hours, without multiple serious complications
P60A	Newborn infant, death <5 days after admission without significant OR procedure
P60B	Newborn infant, transferred <5 days after admission without significant OR procedure, referred
P60C	Newborn infant, transferred <5 days after admission without significant OR procedure, not referred
P61A	Newborn infant, admission weight <600 g with significant OR procedure
P61B	Newborn infant, admission weight <600 g without significant OR procedure
P61C	Newborn infant, admission weight 600–749 g with significant OR procedure
P61D	Newborn infant, admission weight 600–749 g without significant OR procedure
P61E	Newborn infant, admission weight <750 g, death <29 days after admission
P62A	Newborn infant, admission weight 750 – 874 g with significant OR procedure

DRG	DRG Text
P62B	Newborn infant, admission weight 750–999 g, death <29 days after admission
P62C	Newborn infant, admission weight 875–999 g with significant OR procedure
P62D	Newborn infant, admission weight 875 - 999 g without significant OR procedure
P62E	Newborn infant, admission weight 750–999 g, death <29 days after admission
P63Z	Newborn infant, admission weight 1000–1249 g without significant OR procedure, without artificial respiration >95 hours
P64Z	Newborn infant, admission weight 1250–1499 g without significant OR procedure, without artificial respiration >95 hours
P65A	Newborn infant, admission weight 1500–1999 g without significant OR procedure, without artificial respiration >95 hours, with multiple difficult complications
P65B	Newborn infant, admission weight 1500–1999 g without significant OR procedure, without artificial respiration >95 hours, with serious complication
P66A	Newborn infant, admission weight 2000–2499 g without significant OR procedure, without artificial respiration >95 hours, with multiple serious complications
P66B	Newborn infant, admission weight 2000–2499 g without significant OR procedure, without artificial respiration >95 hours, with serious complication
P67A	Newborn infant, admission weight >2499 g without significant OR procedure, without artificial respiration >95 hours, with multiple serious complications
P67B	Newborn infant, admission weight >2499 g without significant OR procedure, without artificial respiration >95 hours, with serious complication
R01A	Lymphoma and leukaemia with major OR procedures, with extremely difficult CC, with complex OR procedure
R01B	Lymphoma and leukaemia with major OR procedures, with extremely difficult CC, without complex OR procedure
R02Z	Major OR procedures with extremely difficult CC, with complex OR procedure in the case of haematological and solid tumours
R03Z	Lymphoma and leukaemia with specific OR procedure, with extremely difficult CC
R04A	Other haematological and solid tumours with specific OR procedure, with extremely difficult or difficult CC
R04B	other haematological and solid tumours with other OR procedure, with extremely difficult or difficult CC
R05Z	Radiotherapy in the case of haematological and solid tumours, more than 9 sessions or in the case of acute myeloid leukaemia, age <19 years or with extremely difficult CC
R06Z	Radiotherapy in the case of haematological and solid tumours, more than 9 sessions or in the case of acute myeloid leukaemia, age >18 years, without extremely difficult CC
R07A	Radiotherapy in the case of haematological and solid tumours, fewer than 10 sessions, except in the case of acute myeloid leukaemia, age <19 years or with extremely difficult CC
R07B	Radiotherapy in the case of haematological and solid tumours, fewer than 10 sessions, except in the case of acute myeloid leukaemia, age >18 years, without extremely difficult CC

DRG	DRG Text
R12A	Other haematological and solid tumours with major OR procedures, with extremely difficult CC, without complex OR procedure
R12B	Other haematological and solid tumours with major OR procedures without extremely difficult CC, with complex OR procedure
R12C	Other haematological and solid tumours with major OR procedures without extremely difficult CC, without complex OR procedure
R13Z	other haematological and solid tumours with specific OR procedure, without extremely difficult or difficult CC
R14Z	Other haematological and solid tumours with other OR procedures without extremely difficult CC or therapy with radiological nuclides in the case of haematological and solid tumours, length of stay more than one day
R16Z	Highly complex chemotherapy with operative intervention in the case of haematological and solid tumours
R60A	Acute myeloid leukaemia with highly complex chemotherapy
R60B	Acute myeloid leukaemia with intensive chemotherapy with complicating diagnosis or dialysis or port implantation
R60C	Acute myeloid leukaemia with intensive chemotherapy without complicating diagnosis, without dialysis, without port implantation, with extremely difficult CC or with moderately complex chemotherapy with complicating diagnosis or dialysis or port implantation
R60D	Acute myeloid leukaemia with intensive chemotherapy without complicating diagnosis, dialysis or port implantation, without extremely difficult CC or moderately complex chemotherapy, without complicating diagnosis, dialysis or port implantation, with extremely difficult CC
R60E	Acute myeloid leukaemia with dialysis or with extremely difficult CC
R60F	Acute myeloid leukaemia with moderately complex chemotherapy, without complicating diagnosis, without dialysis, without port implantation or with local chemotherapy
R60G	Acute myeloid leukaemia without chemotherapy, without dialysis, without extremely difficult CC
R61A	Lymphoma and non-acute leukaemia, with sepsis
R61B	Lymphoma and non-acute Leukaemia, without sepsis, with agranulocytosis or port implantation, with extremely difficult CC
R61C	Lymphoma and non-acute leukaemia, with dialysis
R61D	Lymphoma and non-acute leukaemia without dialysis, without sepsis, with agranulocytosis or port implantation, without extremely difficult CC
R61E	Lymphoma and non-acute leukaemia without dialysis, without sepsis, without agranulocytosis, without port implantation, with extremely difficult CC
R61F	Lymphoma and non-acute leukaemia without dialysis, without sepsis, without agranulocytosis, without port implantation, without extremely difficult CC, with complex diagnosis or with osteolysis
R62A	other haematological and solid tumours with complicating diagnosis or dialysis or port implantation
R63A	Other acute leukaemia with highly complex chemotherapy, with dialysis or sepsis or with agranulocytosis or port implantation or with extremely difficult CC
R63B	Other acute leukaemia with intensive chemotherapy, with dialysis or sepsis or with agranulocytosis or port implantation

DRG	DRG Text
R63C	Other acute leukaemia with moderately complex chemotherapy with dialysis or sepsis or with agranulocytosis or port implantation
R63D	Other acute leukaemia with intensive or moderately complex chemotherapy, without dialysis, without sepsis, without agranulocytosis, without port implantation, with extremely difficult CC
R63E	Other acute leukaemia with local chemotherapy, with dialysis or sepsis or with agranulocytosis or port implantation or with extremely difficult CC
R63F	Other acute leukaemia without chemotherapy, with complicating diagnosis or port implantation
R63G	Other acute leukaemia with local chemotherapy, without dialysis, without sepsis, without agranulocytosis, without port implantation, without extremely difficult CC or without chemotherapy, without complicating diagnosis, without port implantation
R65Z	Haematological and solid tumours, length of stay one day
S60Z	HIV illness, length of stay one day
S62Z	Malignant tumour in the case of HIV illness
S63A	Infection in the case of HIV illness with complex diagnosis and extremely difficult CC
S63B	Infection in the case of HIV illness without complex diagnosis or without extremely difficult CC
S64Z	Other HIV illness
S65A	Other afflictions in the case of HIV illness with heart attack, chronic ischemic heart disease or extremely difficult CC
S65B	Other afflictions in the case of HIV illness without heart attack, chronic ischemic heart disease or extremely difficult CC
T01A	OR procedure in case of infectious and parasitical illnesses with complex OR procedure or following organ transplantation
T60B	Sepsis with complicating procedures or following organ transplantation, without extremely difficult CC, age <16 years or without complicating procedures, except following organ transplantation, with extremely difficult CC, age <16 years
T63A	Viral illnesses following organ transplantation
W01B	Polytrauma with artificial respiration or craniotomy, without early rehabilitation, with artificial respiration >263 hours
W01C	Polytrauma with artificial respiration or craniotomy, without early rehabilitation, without artificial respiration >263 hours
X07A	Replantation in cases of traumatic amputation, with replantation of more than one toe or more than one finger

Table A-3:
DRGs with independently calculated cost weights for treatment by attending doctors (ch. 3.3.1.1)

DRG	DRG Text
C08Z	Extra capsular cataract extraction (ECCE)
C17Z	operation on the retina with pars plana vitrectomy and other complex procedures without extra capsular cataract extraction (ECCE)
D06B	operation on the paranasal sinuses, Mastoid, complex operations on the middle ear and other operations on the salivary glands, age >15 years
D12B	Other operations on the ear, nose, mouth and throat
D22B	operation on the oral cavity and mouth except in the case of malignant tumour or floor of the mouth or vestibulum sculpture
D30A	Tonsillectomy except in the case of malignant tumour or various operations on the ear, nose, mouth and throat without extremely difficult CC, with extensive surgery
D30B	Tonsillectomy except in the case of malignant tumour or various operations on the ear, nose, mouth and throat without extremely difficult CC, without extensive surgery
D38Z	Moderately complex operations to the nose
D40Z	Tooth extraction and reconstruction
D61A	Balance disorders (dizziness) with loss of hearing or tinnitus
D62Z	Epistaxis
D63Z	Otitis media or infections of the upper respiratory tract
D66Z	Other ear, nose, mouth and throat illnesses
G24Z	operations in the case of abdominal hernias, umbilical hernias and other hernias, age >0 years or ambilateral operations in the case of groin and femoral hernias, age >0 years and <56 years or operations in the case of groin and femoral hernias, age >55 years
I18B	Less complex operations to the knee joint, elbow joint and lower arm, age >15 years
I20C	operations to the foot without complex surgery and without serious damage to soft tissue

DRG	DRG Text
I23B	Localised excision and removal of osteosynthetic material except for the hip joint and femur without complex removal of osteosynthetic material
I24Z	Arthroscopy including biopsy or other operation to the knee joint, elbow joint and lower arm
I44A	Implantation of a bicondylar endoprosthesis or other knee joint endoprosthetic implantation/revision
I48Z	Hip joint revision or replacement without complicating diagnosis, without arthrodesis, without complex operation, without extremely difficult CC
I68B	illnesses and injuries in the region of the spinal column treated non-operatively, length of stay more than one day, age >55 years, or with extremely difficult or difficult CC without complex diagnosis
I68C	illnesses and injuries in the region of the spinal column treated non-operatively, length of stay more than one day, age <56 years, without extremely difficult or difficult CC
J13Z	Minor operations on the Mamma except for malignant tumour
J23Z	Major operations on the Mamma in the case of malignant tumour
J25Z	Minor operations on the Mamma in the case of malignant tumour without extremely difficult or difficult CC
L06B	Minor operations on the urinary bladder without extremely difficult CC
L17Z	Other operations on the Urethra
L20Z	Transurethral operation except for resection of the prostrate and complex Ureterorenoscopes without extracorporeal shock wave lithotripsy (ESWL)
L63C	Infections of the urinary organs without extremely difficult CC, age >2 years
L64B	Urinary stones and obstructions of the urinary passage, age <76 years and without extremely difficult or difficult CC
L66Z	Urethral stricture, other minor to moderate illnesses of the urinary organs, length of stay longer than one day or complaints and symptoms of the urinary organs or urethrocystoscopy
M01B	Major operation on the male pelvic organs without extremely difficult CC
M02Z	Transurethral resection of the prostate
M04B	Operation on the testes without extremely difficult CC

DRG	DRG Text
M60B	Malignant tumours of the male sexual organs, length of stay one day or age > 10 years, without extremely difficult CC
M62Z	Infection/inflammation of the male sexual organs
N04Z	Hysterectomy except due to malignant tumour, with extremely difficult or difficult CC or complex operation
N05B	Ovariectomy and complex operation on the tubae uterinae except due to malignant tumour, without extremely difficult or difficult CC
N06Z	Complex reconstructive operation on the female sexual organs
N09Z	Other operations on the Vagina, Cervix and Vulva or brachytherapy in cases of illnesses and disorders of the female sexual organs without extremely difficult CC
N10Z	Diagnostic curettage, hysteroscopy, sterilisation, pertubation
N14Z	Hysterectomy with pelvic floor sculpture except due to malignant tumour or brachytherapy in case of illnesses and disorders of the female sexual organs, a length of stay of more than one day, with extremely difficult CC
N21Z	Hysterectomy except due to malignant tumour, without extremely difficult or difficult CC, without complex surgical operation
N23Z	Other reconstructive operations on the female sexual organs
N25Z	Other operation on the uterus and adnexa except due to malignant tumour, without complex diagnosis or diagnostic laparoscopy
O01C	Caesarean section without multiple complicating diagnoses, length of pregnancy >33 full weeks or with complicating diagnosis, length of pregnancy 26 to 33 full weeks or without complicating diagnosis, length of pregnancy up to 33 full weeks
O01D	Caesarean section with complicating diagnosis, length of pregnancy longer than 33 full weeks
O01E	Caesarean section without complicating diagnosis, length of pregnancy longer than 33 full weeks
O60D	Vaginal delivery without complicating diagnosis
O62Z	Imminent miscarriage
O64A	Ineffectual labour, length of stay more than one day

DRG	DRG Text
O65C	Other prenatal inpatient admissions without intrauterine therapy of the foetus, without extremely difficult or difficult CC
P67C	Newborn infant, admission weight >2499 g without significant OR procedure, without artificial respiration >95 hours, with other complications, length of stay more than one day
P67D	Newborn infant, admission weight >2499 g without significant OR procedure, without artificial respiration >95 hours, without other complications or without serious complications, length of stay one day

Table A-4:
Comparison of DRGs per MDC (ch. 3.4.1.1)

MDC	Designation	No.of DRGs 2005	No. of DRGs 2006	Change (in %)
Pre	Pre-MDC	54	57	+ 6
01	Illnesses and disorders of the nervous system	71	78	+ 10
02	Illnesses and disorders of the eye	24	26	+ 8
03	Illnesses and disorders of the ear, nose, mouth and throat	41	50	+ 22
04	Illnesses and disorders of the respiratory organs	49	50	+ 2
05	Illnesses and disorders of the circulatory system	102	112	+ 10
06	Illnesses and disorders of the digestive organs	59	60	+ 2
07	Illnesses and disorders of the hepatobiliary system and pancreas.	33	29	- 12
08	Illnesses and disorders of the musco-skeletal system and connective tissue	88	108	+ 23
09	Illnesses and disorders of the skin, subcutis and mamma	41	42	+ 2
10	Endocrinal, nutritional and metabolic illnesses	27	29	+ 7
11	Illnesses and disorders of the urinary organs	41	46	+ 12
12	Illnesses and disorders of the male sexual organs	20	18	- 10
13	Illnesses and disorders of the female sexual organs	31	31	0
14	Pregnancy ,birth and confinement	18	24	+ 33
15	Neonatal	38	42	+ 11
16	Illnesses of the blood, the blood producing organs and the immune system	9	12	+ 33
17	Haematological and solid tumours	41	46	+ 12
18A	HIV	6	7	+ 17
18B	Infectious and parasitical illnesses	15	17	+ 13
19	Psychological illnesses and disorders	10	10	0

MDC	Designation	No.of DRGs 2005	No. of DRGs 2006	Change (in %)
20	Alcohol and drug use, and alcohol and drug induced psychological disorders	8	9	+ 13
21A	Polytrauma	10	12	+ 20
21B	Injuries, poisonings and the toxic effects of drugs and medications	14	13	- 7
22	Burns	8	7	- 13
23	Factors that influence the state of health and use of the health system	11	10	- 9
Error DRGs	Error DRGs and miscellaneous DRGs	9	9	0
Total		**878**	**954**	**+ 9**