

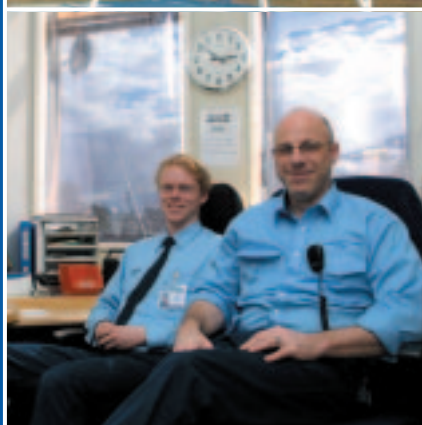


Diagnosis Related Groups

# Changed Financing



**LANDSPÍTALI**  
UNIVERSITY HOSPITAL



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## Introduction

Landspítali - University Hospital (LSH) is aiming for a new strategy for financing its clinical operations for the year 2005. For the past few years, a secondary classification system (DRG), which describes all clinical operations of the hospital in relation to finance and outcomes, has been implemented. This project is already in good progress and has proven to be successful.

Today, LSH (as well as all other hospitals in Iceland) is financed by a fixed annual governmental budget. Over the past years, many western countries have implemented new methods for financing their hospital operations, acknowledging the fact that hospital budgets must take into account variable outcomes and fluctuating operations. Previous methods (fixed budgets) have proven to be inhibiting in many cases for hospital operations because for example their lack of incentive. Today there is a pressing need for efficiency in all operations and to be able to compare outcomes of public organisations to privately owned organisations by using comparable and standardised methods.

Sociological changes, level of public knowledge, new technology, as well as new emphasis in management, all point to the fact that a new method of financing hospitals must be established. Increasing demand for quality service and measurable outcomes for particular treatments, further stresses this need for change. In order to be able to present quality service and performance statistics, approved and standardised methods have to be applied. This also enables budgetary planning and statistical analysis.

A second classification system for all operations in Landspítali University Hospital is a complex and multidimensional task to endeavour. Numerous staff members have participated in this project over the years 2001-2004 and I would like to thank everyone for their invaluable contribution. Positive and progressive mindset among staff members, has placed the hospital in the position of being able to utilize the DRG System to its fullest, both inside the hospital and outside, in negotiations with healthcare authorities regarding financing of the hospital services. A second classification system is now being used for all clinical operations and the actual cost of services performed is calculated on an individual patient basis.

With the publication of this first report on the DRG project at Landspítali University Hospital, the hospital administration would like to introduce the DRG project, its core elements as well as its possibilities in relation to case costing, and new methods of financing hospitals. The project has just begun and will be under constant revision with international collaboration, in keeping up with changes in the patient population and the healthcare system.

It is hoped that the first steps in implementing a financing system for the hospital based on cost per production unit (DRG) will be taken no later than 2005. The system will be used within the hospital for distribution of funding for all specialities and divisions.

Magnús Pétursson  
Chief Executive





## Changed financing of LSH

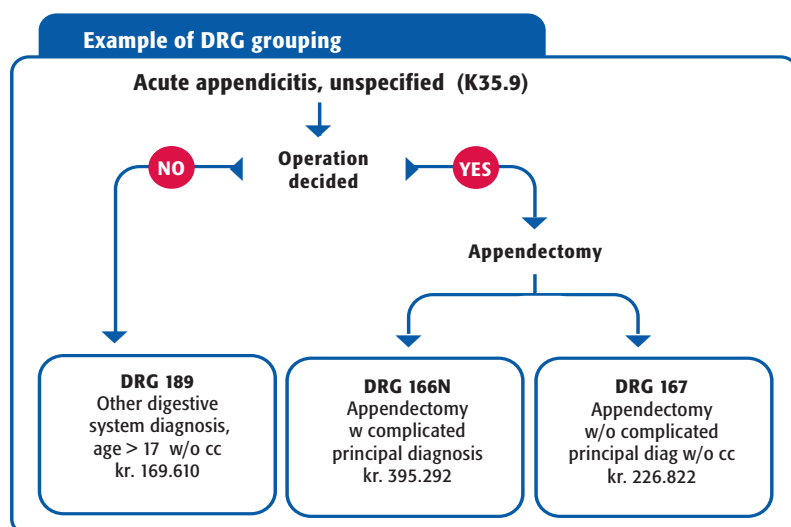
The project "Changed Financing of LSH" started officially in the year 2000 with the decision to test the use of the secondary classification system, the DRG System, in the Women's Clinic of the hospital.

The purpose of this pilot project was to improve management information on hospital activities, to cost analyse and for cost reduction. By the end of the first year of the pilot project it was decided to extend the project to the surgical division. Shortly thereafter a decision was made to implement the DRG System, or other secondary classification systems, in all clinical activities of LSH. The implementation phase should be finished in the midst of year 2004. This paper is a project report as well as a contemplation on the special effects of implementing the DRG System. This report will also demonstrate many ways of utilising data after DRG grouping as well as data from the case costing system developed simultaneously.

## What is secondary classification in health care services?

Secondary classification in health care services is based on the health professionals' documentation. DRG or diagnosis related groups is based on a grouping logic for more than 10.000 diagnoses (ICD-10) and approximately 6.000 surgical procedure codes (NCSP) that group patients into DRG groups. Other decisive factors used for grouping are age, sex, length of stay and discharge status of patients. The main rule is that DRG groups are homogenous in a clinical as well as economical way.

The project "Changed financing of LSH" includes all clinical activities of the hospital. Inpatients in acute care are grouped in classical DRG groups but adaptation has been done for other divisions, such as geriatrics, psychiatry, rehabilitation and palliative care. DRG-O, a secondary patient classification for day- and outpatient



care was executed in January 2004. The implementation of the DRG-O System in day- and outpatient wards is in progress and will be completed before the end of this year.

## Divisions of production and other divisions

A case costing project has been in progress along with the implementation of the DRG System and other secondary classification systems. From the year 2004 all cost is allocated to patient activities except cost of investments, maintenance and equipment, S-marked drugs in day- and outpatient care and education and research. The hospital is divided into divisions of production, service divisions and support services. The divisions of production are inpatient wards and day- and outpatient wards or services that provide direct care to patients. Service divisions are departments that provide and sell specialised services by order from clinical divisions like laboratory tests, MRI and anaesthesia. Support services are for instance accounting department, salaries department, information technology, executive board etc., but cost of these services is allocated in the hospital's accounting system to the production divisions. The production divisions' revenues are based on a fixed budget but also partly on productivity. A fixed budget is set for education and research. The production divisions have to "pay" the service divisions for services rendered. For the year 2004 an estimated plan for produced DRG units at LSH was set at 70.000 DRG units. These units reflect all production divisions of the hospital.

Estimated DRG units in the year 2004	
Divisions	DRG units
Paediatrics	4.000
Obstetrics and gynaecology	5.000
Psychiatry	11.300
Medicine I	13.500
Medicine II	2.800
Surgery and anaesthesia, intensive care and OR	16.100
Emergency services	9.000
Rehabilitation	2.300
Geriatrics	6.000
<b>Total</b>	<b>70.000</b>

Strategic planning for the project has taken place stating that from summer 2004 secondary classifications are employed in all clinical activities at LSH. The project's goal is a new financing system for the hospital based on cost per production unit (DRG) no later than 2005. The chief executive board of LSH has negotiated with all clinical divisions, and the contracts embrace activities, productivity, new funding method and other factors related to the implementation of the DRG System. These contracts are mostly pilot contracts. The Women's clinic has had an actual contract for financing the division since 2002, stating a fixed budget of 70% and a budget based on productivity or DRG units of 30%. Surplus was in 2002 and the Women's clinic acquired 30% of the surplus.



## The development of the DRG System in Iceland

The development of case mix systems goes back a long way and many such systems have been produced over the years. Of these systems the American DRG System has been the most popular. The original DRG System was developed at Yale University. In time, it has undergone some changes and many systems have been developed in various parts of the world. The DRG system is a secondary classification system that provides a means for relating the types of patients a hospital treats, or its production, to the cost incurred by that hospital. The DRG groups must be economically as well as clinically homogenous. After discharge patient related data, already existing in various information systems in hospitals, are imported and used for classification. The original work of the Yale group is still the essence of the case mix systems in use around the world today. The NordDRG System is a joint project of the Nordic countries, based on the American HCFA 12 version.

The history of the DRG System in Iceland goes back some 15-20 years. At that time a Nordic project was slowly forming though formally it is stated from the year 1995. With the merging of the two hospitals, Ríkisspítalar and Sjúkrahús Reykjavíkur, into Landspítali - University Hospital in the year 2000, the DRG project was reactivated. A project statement was made as well as plans for implementing the system in all clinical areas of the hospital. The merger imposed great operational and strategic changes and the need for accurate and solid clinical and management information became very evident. Integration and reform of all information systems like the ADT system, accounting system, laboratory system etc. was necessary. These operational changes were the basis for the development and implementation of the DRG System. A demand for a better information system for managers as well as a demand for more efficiency was the main catalyst for the development and implementation of the system. Most of the developmental process has taken place within LSH under the supervision of the department of information .

DRG classification increases transparency of operations and projects a clear picture of the hospital's activities. Benchmarking becomes possible both within the country as well as abroad. In a systematical way the classification describes diverse and often dissimilar patient groups being treated. The DRG System is suitable in all acute care settings in general health care systems. Specific solutions are needed for geriatric divisions as well as for psychiatric and rehabilitative divisions and hospice. For day- and outpatient ward a by-product of the DRG system has been developed, the DRG-O System. Short stay patients with a length of stay less than 1 day get classified in the DRG-O System. Recently the hospital's emergency department took the system into use and before the end of 2004 all day- and outpatient wards in the hospital will be using the DRG-O System.





## Joint project in the Nordic countries

The NordDRG is a joint Nordic project for adjusting and using the DRG System in all the Nordic countries. All the Nordic countries except Iceland have started financing their hospitals based on production or DRG units, either partly or totally.

The Nordic countries each go their own way regarding the implementation process and have developed their own versions of the system. The Nordic Centrum for Classification, founded in 1987, is responsible for all developmental work on the NordDRG System and offers consultations and support to all the countries. The Centrum is located in Sweden and is funded by health authorities of the Nordic countries. On Iceland's behalf, Sveinn Magnússon divisional manager at the Ministry of Health and Social Security is a member on the Centrum's board. The Centrum has various expert groups working on developmental issues where each country has its member. The expert groups meet regularly to go through problems and faults, make suggestions for appropriate adjustments and changes, which get approved by the board.

Coordination in the registration of diseases is a key factor and hence imperative to use the same classification systems on diseases and surgical procedures in all of the Nordic countries. (ICD-10 for diseases and NCSP, soon to be NCSP+, for surgical and other procedures). The basis for the NordDRG System is in all cases the same, which allows for comparisons between the countries. During the developmental phase in Iceland, the Swedish Classification Center (CPK) has given much assistance and support.



## Clinical activities of LSH described with DRG

The DRG System describes the hospital activity in a systematic way and increases transparency and utilisation of information. A few examples follow.

In each patient's hospitalisation or visit, diagnoses describing the main reason for treatment, comorbidities which affect the inpatient stay and complications are registered. Operations and/or procedures are also registered. DRG are based on these registrations after they have been coded.

### 5 most common diagnoses at LSH 2003 by number of discharges

Principal diagnosis	Number of disch.	Percentage
Spontaneous vertex delivery	1.739	4,9%
Medical abortion - complete or unspecified, without cc.	824	2,3%
Preparatory care for subsequent treatment, not elsewhere classified	670	1,9%
Mental and behavioural disorders due to use of alcohol - dependence syndrome	476	1,3%
Atherosclerotic heart disease	458	1,3%

### 5 most common procedures at LSH 2003 by number of discharges

Principal procedure	Number of disch.	Percentage
Repair of partial rupture of perineum	1.095	3,1%
Angiography of heart and/or coronary arteries	1.003	2,8%
Vacuum aspiration of products of conception from uterus	762	2,1%
Lower uterine segment caesarean section	537	1,5%
Percutaneous transluminal coronary angioplasty with insertion of stent	377	1,1%

Registration of diagnoses and procedures can also be used for other secondary classifications in health care, quality indicators, research and planning. These data on the health status of patients at LSH and on the utilisation of health care services are very important for governmental agencies and directors at LSH.

### Average number of diagnoses and procedures per patient at LSH 2003

Divisions	Avg. number of diagnoses		Avg. number of procedures	
	2003	2002	2003	2002
Paediatrics	1,5	1,5	0,4	0,3
Obstetrics and gynaecology	1,8	1,7	0,8	0,7
Psychiatry	1,7	1,8	0,0	0,0
Medicine I	1,9	1,6	0,3	0,3
Medicine II	1,6	1,2	0,0	0,0
Surgery	1,4	1,3	1,2	1,2
Geriatrics	3,4	2,5	0,0	0,0
Rehabilitation	2,4	2,2	0,0	0,1
Anaesthesia, intensive care and OR	1,0	0,9	1,0	0,9
<b>Total LSH</b>	<b>1,72</b>	<b>1,54</b>	<b>0,62</b>	<b>0,49</b>







Other nations' experiences reveal that clinical documentation improves with implementation of secondary classification systems, because there is a distinct connection between secondary classification and clinical documentation. Mean number of diagnoses and procedures increases the first years after implementation of a secondary classification systems. The mean number of diagnoses per discharge or visit was 1.72 in the year 2003 which was an increase of little less than 12% from the year 2002. This number is bound to increase over the next few years. The mean number of diagnoses for British hospitals LSH was being benchmarked with in the report: The Merger of the Reykjavik Hospitals: Performance Assessment made by the Icelandic National Audit Office in 2003, was 2.38. Complications and comorbidities affecting the inpatient stay is what is mostly lacking in the clinical documentation at LSH.

## Quality of clinical coding

When the income of health care institutions is based on secondary classification systems it is very important that all clinical documentation and coding is done as soon as possible after discharging the patient. The lag time between discharge and documentation has indeed improved with the implementation of the DRG System. The quality of clinical coding is regularly inspected and very few errors are observed.

### Quality of clinical coding at LSH 2003

Return code	Number of disch.	Percentage
Grouping completed technically	34.757	97,35%
No principal diagnosis	792	2,22%
Sex of the patient is incoherent with the diagnosis	12	0,03%
Patient is too old for current diagnosis	4	0,01%
Rare or false combination of diagnosis and procedure	34	0,10%
Other error	105	0,29%
<b>Total</b>	<b>35.704</b>	<b>100,00%</b>

## Age

The average age of inpatients at LSH 2003 was 46 years but differed between divisions ranging from 6 years to 82 years.

### Average age of patients at LSH 2003

Divisions	Mean age
Division of paediatrics	6
Division of obstetrics and gynaecology	33
Division of psychiatry	37
Division of medicine I	62
Division of medicine II	61
Division of surgery and anaesthesia, intensive care and operating rooms	51
Division of rehabilitation	58
Division of geriatrics	82

## The most common DRGs at LSH

The following tables demonstrate the three most common DRGs at LSH in the year 2003 by number of discharges, length of stay and total cost.

### Most common DRGs at LSH 2003 by number of discharges

DRG		Number of disch.	Percentage
373	Vaginal delivery w/o complicating diagnoses	1.829	5,1%
426	Depressive neuroses	1.118	3,1%
3810	Abortion, short therapy	1.091	3,1%

### Most common DRGs at LSH 2003 by total number of patient days

DRG		Number of days	Percentage
430	Psychoses	34.272	12,4%
426	Depressive neuroses	17.760	6,4%
435	Alcohol/drug abuse or dependence, detoxification or other symptomatic treatment w/o cc	15.959	5,8%

### Most common DRGs at LSH 2003 by total cost

DRG		Number of disch.	Total cost
430	Psychoses	1.091	839.491.003
012	Degenerative nervous system disorders	238	430.975.806
014	Specific cerebrovascular disorders except TIA	455	426.617.858

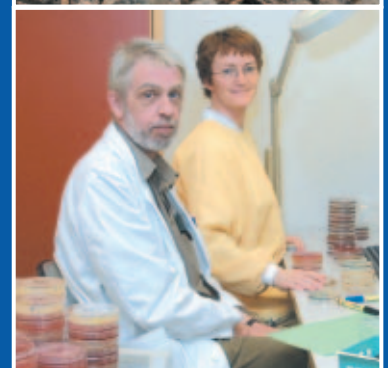
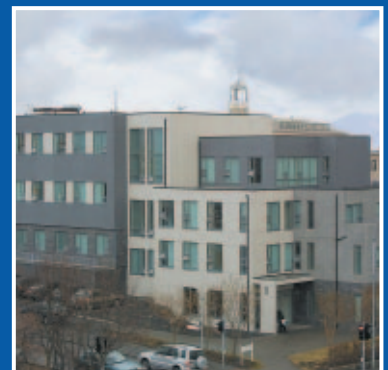
## Cost allocation in DRG groups

The LHS cost accounting system is based on the methods of Activity-Based-Costing (ABC). The ABC method is used in distribution of indirect cost to activities or projects.

The ABC method includes four steps:

1. Analysis of activities.
2. Isolation of cost related to activities.
3. Detection of cost drivers.
4. Allocation of cost.

The reason for using the ABC method in LSH's cost accounting system is mainly to provide managers with more detailed information on production and production cost. The advantages of the method are better decision making for pricing, in the use of finance, in marketing and also and incentive for clinical and financial developments.





Many information systems are in use at LSH. That includes an ADT system as well as a financial system (GL) providing financial information.

Data from the financial system (GL) are imported into an independent information system, Framtak, where they are defined according to specific allocation rules based on the ABC method. The information system Framtak also imports data from all other information systems in the hospital, both clinical as well as financial.

Following is an example on how cost is allocated to a patient in DRG 209A:

<b>209A Major joint procedures of lower extremity, not reoperation</b>		
Surgery cost	134.431 kr.	Operation room cost is 103.546 kr. and Surgeon's cost is 16.102 kr. and is distributed by the patients operation minutes. Post op cost is 14.783 kr. and is distributed by the patients hours in post op.
ICU cost	238.430 kr.	The patient stayed 29 hours in the ICU with the acuity of 2,7. The total cost of ICU for this patient is 238.430 kr. and thereof doctor's cost 19.138 kr.
Lab costs	171.237 kr.	Lab cost is documented down to the patient's social security number. Here the cost of the bloodbank is 33.401 kr., lab. cost 102.268 kr. and the cost of x-ray is 35.568 kr.
Doctors cost	139.148 kr.	Doctor's cost is distributed by the amount of hours the patient stayed on the ward. This patient stayed for 180 hours.
Ward cost	178.225 kr.	The cost of the wards incl. salaries is distributed by the number of hours the patient stayed and the acuity. This patient stayed for 180 hours on orthopaedic ward with the acuity 1,14.
Outpatient cost	15.996 kr.	The patient is admitted after going to the emergency unit. The patient is there for 5 hours with a cost of 15.996 kr.
<b>Total cost</b>	<b>877.467 kr.</b>	

In the year 2003 direct and indirect cost was allocated to specific activities except cost for anaesthesia and about 10% of indirect cost at LSH. By the end of 2004 all cost will be allocated to activities. Few cost items, such as investments, maintenance and equipment, education and research, S-marked drugs for out-patients and sales (outside LSH services) are not accounted for in the case costing system, but all these cost items are known.

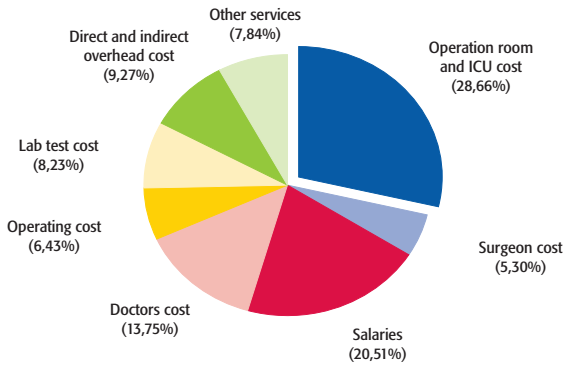
The information system Framtak displays cost information for every patient within each DRG group, as well as the total accumulated cost per DRG group. It also displays the number of patients, average cost for providing the services and the DRG weight for each group.

As well as providing information on cost per patient the system also provides information regarding the distribution of patients within and between departments and divisions (operating rooms, radiology, wards, etc.).

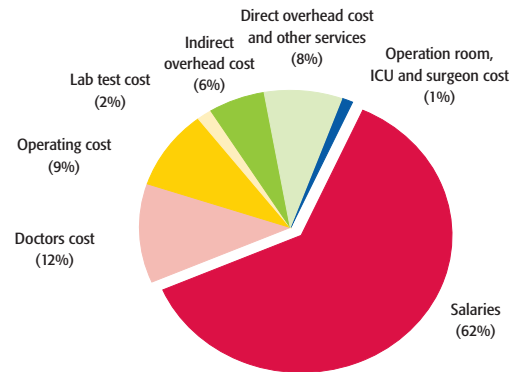


The information system Framtak provides cost information at all production levels at LSH, divisions, departments and service centers. The output is a detailed cost report on total cost per patient.

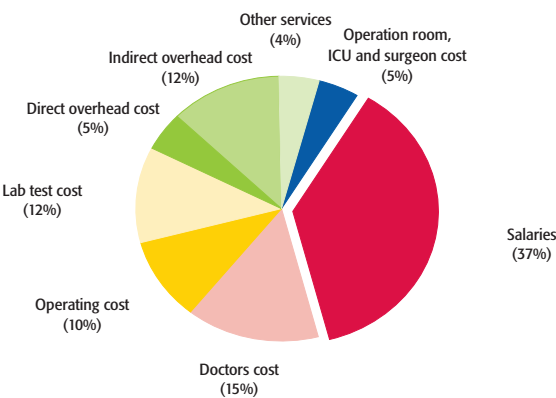
**167 Appendectomy w/o complicated principal diag w/o cc**



**373 Vaginal delivery w/o complicating diagnoses**



**090 Simple pneumonia & pleurisy, age > 17 w/o cc**



## Framtak and monthly reports

Framtak is a home-made information system, which processes information for DRG grouping and case costing per patients.

The most important factors in the data processing of Framtak are:

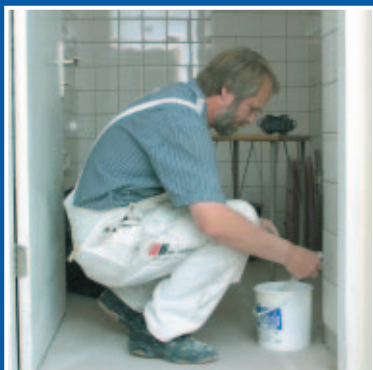
- To gather information about clinical activities of LSH from different hospital information systems.
- To group clinical activities maintaining clinical and economical homogeneity, in this case DRG groups.
- To price the groups each of them representing a distinct number of units or weight (DRG weight). Price of the DRG unit is calculated for each year (DRG unit price).
- To collect cost information and calculate the cost of services for each patient.
- To publish quantitative information on services, income (based on number of units and unit price) and cost per patient.

The information system Framtak has been in development for the past 5 years in the department of information at LSH. Today Framtak collects necessary information regarding all inpatients, discharges and visits at LSH and allocates costs to them. The information system is processed at the end of each month and afterwards information is published on quality and completeness of clinical documentation, DRG statistics for each division, ward and speciality, output per physician among other information. The aim is to publish reliable information on financial status prior to the 20th of the proceeding month.

Framtak imports information from the most important information systems at LSH, such as ADT, outpatient system, OR system and scheduling, laboratory, accounts, salaries etc. Information like inpatient hours, nursing acuity, operating minutes and price of laboratory tests is matched with each hospital stay or patient visit and linked directly to patients' identification number. Various cost i.e. nursing cost, operating cost, doctors cost among other cost is allocated according to specific rules mostly based on inpatient hours, nursing acuity and length of stay.

The result of this information processing is:

- Realistic measurement of quantity and cost of health care services.
- A basis for fee-for-service system.
- A possibility of comparing outputs and outcomes over time within and between wards, divisions or even hospitals (in Iceland or abroad).
- The possibility to increase efficiency and evaluate its outcome.



Following tables exhibit three different DRG reports, the most common DRGs in the Women's Clinic, in orthopaedics and in cardio- and nephrology ward.

#### DRG project at the Division of obstetrics and gynaecology - 3 most common DRGs 2003

DRG		Number of discharges	Avg. income pr. patient	Avg. cost pr. patient	Avg. diffr. pr. patient
373	Vaginal delivery w/o complicating diagnoses	1.829	166.509	159.761	6.748
3810	Abortion, short therapy	1.091	36.801	28.640	8.161
9230	Factors influencing health status and other contacts with health services, short therapy	769	10.989	30.153	-19.164

#### Orthopaedics - 3 most common DRGs 2003

DRG		Number of discharges	Avg. income pr. patient	Avg. cost pr. patient	Avg. diffr. pr. patient
209A	Major joint procedures of lower extremity, not reoperation	356	805.086	638.269	166.817
219	Lower extrem. & humer proc except hip, foot, femur age > 17, w/o cc	255	339.255	293.385	45.870
211	Hip & femur procedures except major joint, age > 17, w/o cc	195	682.479	667.437	15.042

#### Heart and kidney ward - 3 most common DRGs 2003

DRG		Number of discharges	Avg. income pr. patient	Avg. cost pr. patient	Avg. diffr. pr. patient
112	Percutaneous cardiovascular procedures	524	640.629	461.880	178.749
125	Circulatory disorder except acute myocardial infarction, w card cath w/o complex diagnosis	152	220.374	260.137	-39.763
127	Heart failure & shock	128	253.665	393.407	-139.742

## Workload

It is possible to view DRG information in many ways, i.e. the number of discharges per physician and number of patients and their nursing acuity in inpatient wards. This information is used to even out workload.

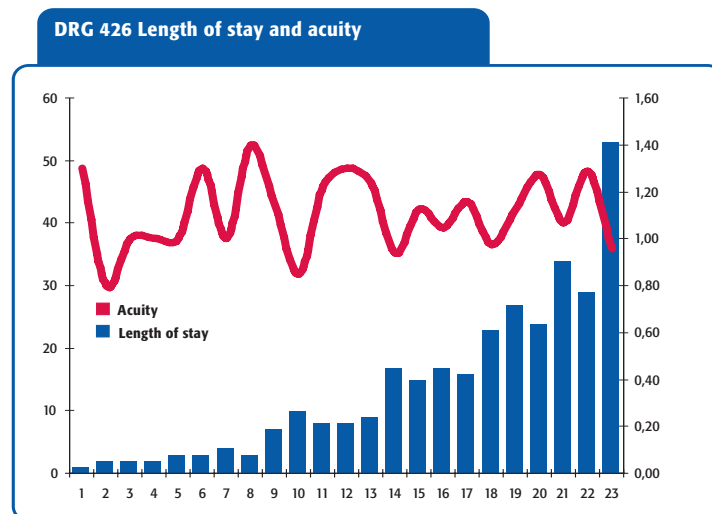






## The DRG Classification System and the Patient Classification System in Nursing

A Patient Classification System in Nursing (PCS), an acuity system, has been in use at LSH for more than a decade. From the beginning of the implementation phase of the DRG System an interest arose regarding a possible integration of the two systems. The PCS system in nursing is a well known system from USA that has been proven reliable and valid in regard to projecting workload and staffing needs. In the system, patients are classified daily into one of 6 groups according to some assessment of their nursing care needs. Each group represents a relative workload or acuity. Workload can hence be calculated for one patient or totaled for one ward. Acuity represents workload per patient or per unit. The PCS system is in use in all 36 inpatient wards at LSH and a psychiatric version is in use in 14 inpatient psychiatric wards.



The literature shows research done on the relationship between nursing and the DRG groups. Most of them have focused on the variance of nursing cost within certain DRG groups or the variance in nursing hours within DRG groups. The workload of patients in the same DRG group can vary greatly.

The PCS has been linked to the hospital's information system Framtak in such a way that the actual nursing cost of each stay is weighted with the acuity of that particular patient during his stay. Therefor making the allocation of nursing cost much more accurate.

Connecting these two systems makes it possible to:

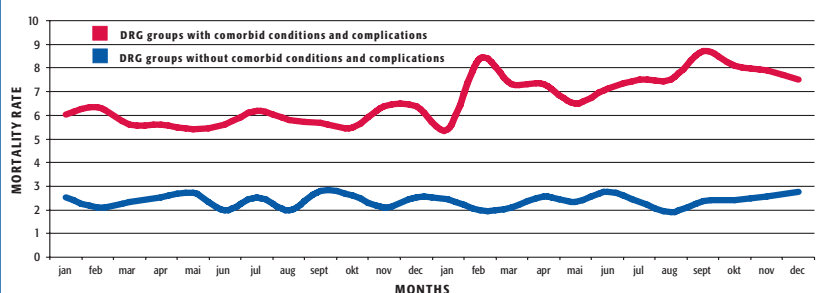
1. Weigh the nursing care hours of the DRG groups with the acuity to allocate nursing cost per patient as accurately as possible (allocation of nursing cost takes into account the different nursing care needs or nursing consumption of patients).
2. Look at the variance in acuity of patients or the workload of patients across or within DRG groups, between wards or doctors for instance.
3. Correlate the acuity of DRG groups with the DRG weights in finding out the correct Icelandic weights for the DRG groups.

## Utilisation of DRG data

DRG data are widely used as the basis for financing patient care. DRG classification data are also used for resource allocation within institutions financed by other approaches. Aside from such use for financial purposes DRG data may be employed in various ways to support quality improvement, enhance research opportunities and aid policy formation and financial decision making.

Any meaningful comparison of health care services over time, between different locations or providers, must be based on a common definition of the elements to be compared. DRG groups can be quite useful in this context as each group contains individuals who share certain characteristics, including a certain set of disorders and treatments. Therefore the clinical variability within each group is limited. Further the definition of each group is independent of time and location. The relative homogeneity within each group and their standard definitions allow the DRG groups to serve as a common basis for comparison. The construction of the DRG groups offer a certain level of risk adjustment with respect to the factors defining the groups and thereby allows a more valuable comparison than is possible based on e.g. principal diagnosis alone.

**A comparison of mortality rates in DRG groups with and without comorbid conditions and complications. Data from the USA.**



Quality improvement in health care relies on precise and accurate documentation of clinical characteristics, treatment provided and outcomes of care. Maintaining a consistent and high level of quality of care requires constant monitoring of sentinel events or adverse events, which may be indicators of substandard quality. Likewise, the effects of quality improvement actions must be continuously observed. As described above, DRG groups may be utilized as the basis for comparison of quality indicators, such as the frequency of hospital infections or readmissions, across institutions or over time. The improved clinical documentation that generally follows implementation of DRG also supports clinical quality improvement efforts. For instance, detailed data on burden of illness at admission and events during hospital stay can help distinguish poor outcomes related to severity of illness from adverse events related to preventable mishaps during hospital stay.

The implementation and use of DRG classification generally leads to improved clinical documentation, that is a more careful choice of diagnoses and procedure codes and a more complete documentation of comorbid conditions, complications





and other clinical states, which may affect the hospital stay. Thus the quality of these data and their value for research purposes are generally enhanced as DRG classification becomes established within the health care community. The data that form the basis for DRG classification may be used for various research purposes e.g. in the fields of epidemiology, health economics and outcomes studies.

The increasing demand and the spiralling costs of health care calls for continuous improvement in forecasting and planning of health services. DRG data can be used in various ways to support and aid planning of services. For instance, DRG data (groups, weights) may be linked with demographic forecasts and health statistics to predict future demands for specific services and thus assess resource requirements in the future.

#### Most common DRGs at LSH 2003 - Inpatients and ambulatory care

DRG		Percentage
373	Vaginal delivery w/o complicating diagnoses	5,1%
426	Depressive neuroses	3,1%
3810	Abortion, short therapy	3,1%
430	Psychoses	3,1%
9230	Factors influencing health status and other contacts with health services, short therapy	2,2%

#### Most common DRGs at LSH 2003 - Inpatients

DRG		Percentage
373	Vaginal delivery w/o complicating diagnoses	5,1%
426	Depressive neuroses	1,8%
430	Psychoses	1,7%
435	Alcohol/drug abuse or dependence, detoxification or other symptomatic treatment w/o cc	1,6%
470	Ungroupable	1,6%

With respect to elective services, such as joint replacement surgery, DRG data can be linked with data from waiting lists for planning purposes, e.g. to assess the resources required to eliminate waiting lists for a specific procedure.

Waiting list for hip replacement – 100 patients.

The DRG weight of the procedure is 3,05  
(that is the DRG list price is 3,05 DRG units).

The DRG unit price of LSH (2004) is kr. 314.600.

Given these data it would cost close to 96 million icelandic kronur  
to eliminate this waiting list:

**100 procedures x 3,05 DRG units/procedure x 314.600 kr/DRG unit = kr.**



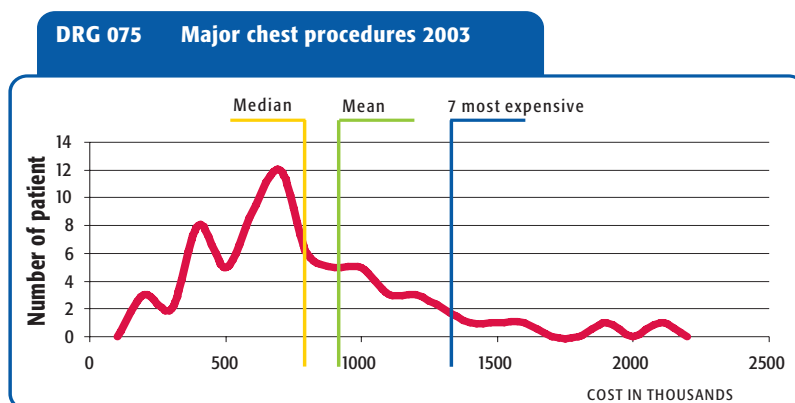
## DRG and quality

“Measurement is central to the concept of quality improvement” is published on WHO’s web-site where the organisation is encouraging quality improvement within health care. Different methods can be used to measure performance such as quality indicators, customer surveys and audit. The choice of a method depends on



the nature of the service to measure. No matter the choice, the approach is more or less the same, a defined process is measured and evaluated. The most common way to measure a process performance is to measure the process outcome, but usually it is recommended to use process measures in order to prevent nonconformity or incidence. That is especially important in processes with large deviations. Therefore the process is monitored. Process monitoring depends on a defined process with measuring points and registration as a confirmation of action. The implementation of DRG enhances quality improvement and process monitoring. The DRG system requires defined processes, consensus regarding outcomes and documentation. Information in the DRG system can be used and reviewed from different perspectives and used for quality improvement. DRG is not only about cost but also information on infrastructure, internal processes and the quality of the service.

Below is an example of how to use DRG information for improvements. The graph shows total cost per patient. The average cost is around ISK 830.000 while the medium is around ISK 770.000. The total number of patients is 68. The cost of the 7 most expensive patients equals to around 20% of the total cost of this group of patients for the year 2003 (ISK 1,3 m - 2,1 m). The 10 most expensive patients cover 27% of the total cost (1,2 m - 2,1).



High cost of patients' treatments can be of normal or natural causes. Nevertheless, it is necessary to examine the variance in cost. If the inspection reveals that higher cost is the result of wrong documentation, differences in procedures or internal processes there is room for improvement. The goal of such improvement project would be to minimize or reduce the number of high cost cases without reducing the quality of care. The success of the intervention can be demonstrated with the trend of cost.

There is great opportunity to use information from the DRG System for quality improvement but the usefulness or the value of the system depends on how managers and the organisation respond. Managers need to prioritise projects according to policy and practice of divisions and the hospital.





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