

# **MANAGEMENT OF DATA, INFORMATION AND KNOWLEDGE IN MEDICINE AND HEALTH SERVICES in SR**

Viera Rusnáková, Slovak Medical University, Bratislava,  
Slovak Republic

Ljuba Bachárová, International Laser Centre, Bratislava,  
Slovak Republic

Martin Rusnák, Faculty of Health Care and Social Work,  
Trnava University, Slovak Republic

# Aim

to describe

- situation and gaps in utilization of ICT in health care practice in Slovakia

as a baseline for setting grid implementation priorities

# Presentation based

on

- personal views from academic environment and literature resources
- experiences from relevant international projects, primarily in the area of
  - health administration, quality management (WHO PATH Project)
  - computerized electrocardiography
  - neurotrauma guidelines project

# Conception of grid

- broader technology concept is assumed to be discussed however
- rectified definition recently discussed e.g. by Szolovits, who strictly recommends limiting GRID to “real” grid computing in its original meaning in computer sciences

# Expectations from ICT in HC

- access to information
- integration
- quality improvement

# Access to information

- Documentation of patients
  - examples of ICT in „stone age“

[illegible]

Pacientka Režková Veronika, 22let, hospitalizovaná na Dermatovenereologické klinice FV a LFUK Bratislava od 24.10.2006 do 2006.

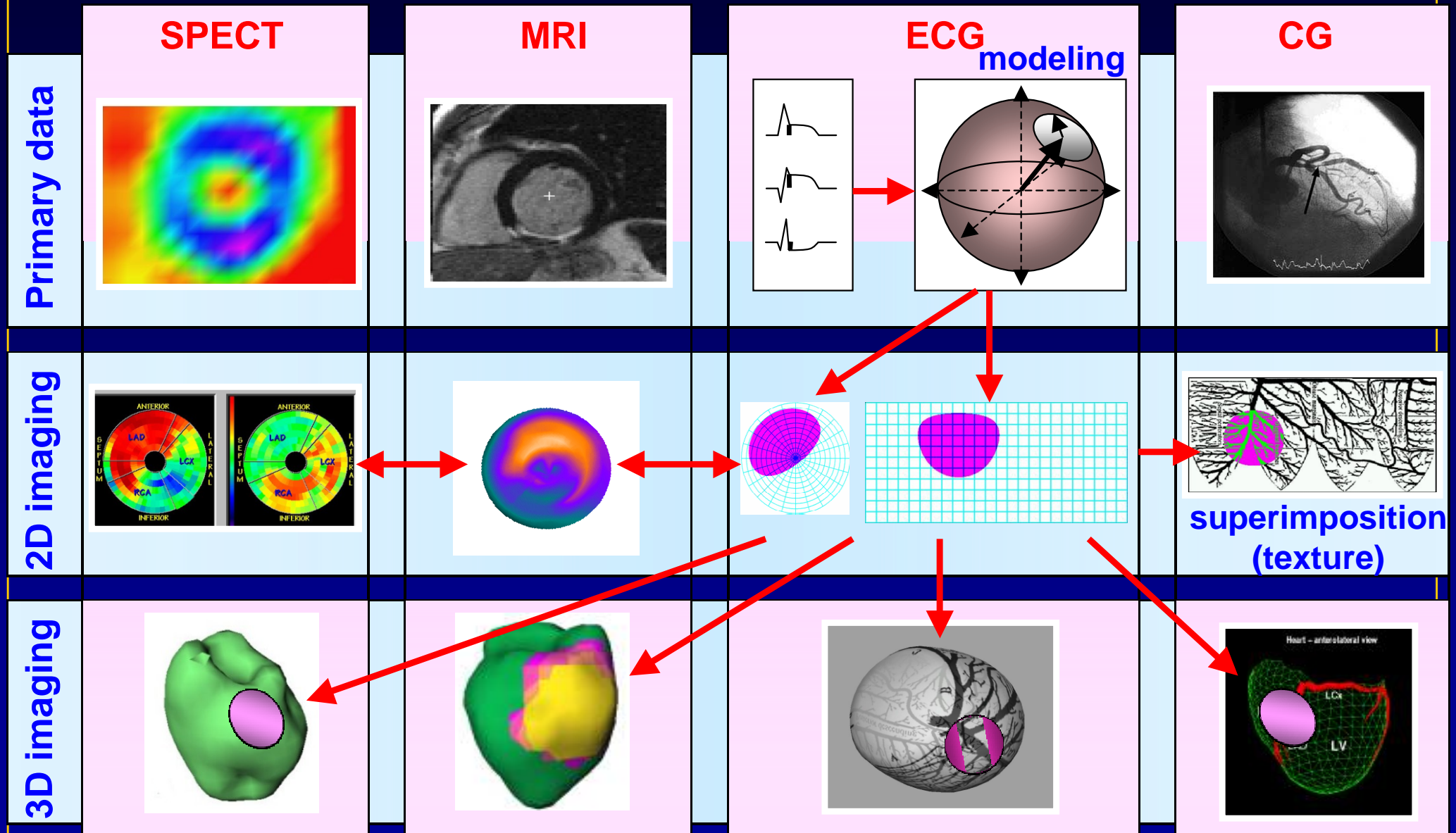
**Anamnéza:**  
RA: nodulárne otvorené lézie na D5-57%, málokdy na D3-83%; na DCMF, predstienka: otvorená skorica ako 36 x na C3 prava, brúzo na Alcheimerevich, lézi: 2-7mm, kóniz, odchýlila v rovine: nevidia  
OK: Pre, pokrmana biele desky ideálne ochrnutia, ako náčrt mála TBC; v kavernách, pneumomach, maloma častí žltých smudľach, slobilaj jej v neprípustie pre zmanadela ako 8 x, opierka: reálna pre zmanadela ako 8 x, pred 20 mikrom  
vypaľovanie vŕ na ľavku marmar, náležale RAR, potom marmarše thauz ústny (žltosť potu) na ľavku, pred 20 mikrom  
potom ochrnutie nevidia, lézi: na D5, na deprezia, málokdy ako vyčistená TK  
A: C3: Chale 1.6x1.6, Cardilín 1.6x1.6, Rivotril 0.2mg 0-0.2  
G4: marmarše od Slokov, nezachod: od Lx, P2, A0-04, UPT: 1, posoda usadila v akyndologu, pred 2-3 mikrom, pred 20 mikrom  
vypaľovanie vŕ na ľavku marmar, náležale RAR, potom marmarše thauz ústny (žltosť potu) na ľavku, pred 20 mikrom  
A: Ústna previečivost na prácu a práce, po týchto ľakách na náčky usadila akožto. Ažergia na ľavku, potu, potu, potu  
a tie ľakú nevidia  
Abery: ústny, alchale obryšampier, obryš černo pivo, 1 x 1 x 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 7

- gap in Health Information Systems in SR

# Examples of complex implementations

- integration of different imaging modalities in cardiology - ECG
- Quality initiatives and E-health
- education and training – E learning

# Different imaging modalities in cardiology : possibilities of ECG



Comparable images

Superimposition of structural and functional characteristics



# ECG / image methods in cardiology

## Current situation:

- Separation of data
- Different/specific data formats, image display capabilities

## Direction of development:

- Modelling and visualization
- Multimodal imaging
- The higher level of information on structural and functional characteristics of the heart
- Diagnostics, monitoring, evaluation of the effect of therapy, emergency intervention, education and research

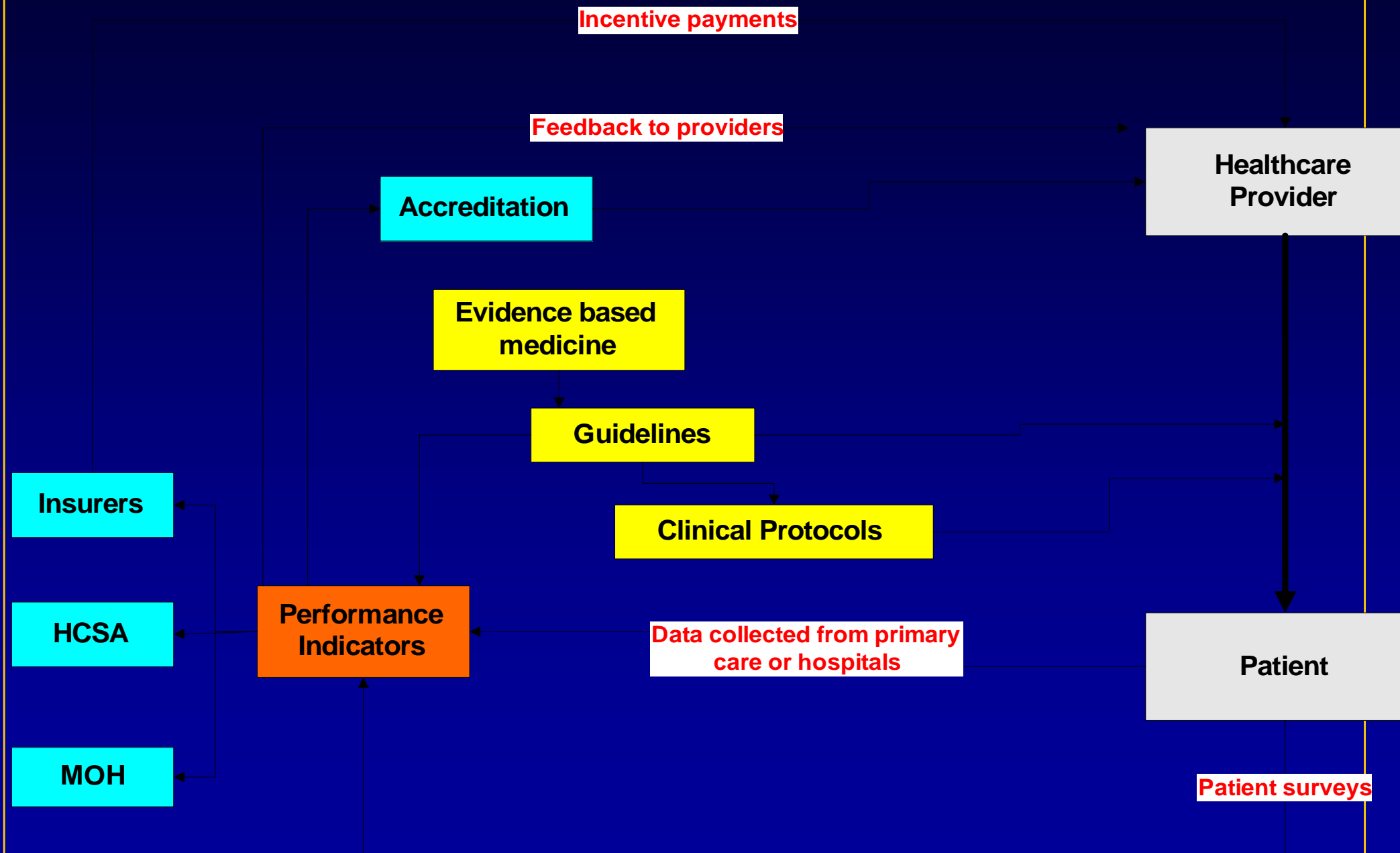
# E health and quality initiatives

## Acceleration of

- International standards implementation;
- Electronic patient records;
- E prescription;
- Health portals;
- Clinical guidelines and protocols;
- Performance indicators monitoring

Challenge for revisions of routine processes

# Integrating the quality initiatives



# Clinical guidelines and protocols integrated in IS

**XANTA - Nemocničný informačný systém**

Formulár Editovať Zobraziť Registre Pacienti Rozpisy Žiadanky Spracovanie Štatistiky Platby Nástroje Nápoveda

✓ ✗ 📄 📁 📂 📅 📆 📇 📈 📉 🔍 ⓘ ?

**Akútny infarkt myokardu [ pridať ]**

**Pacient**

Číslo chor. 170292/H Rodné číslo Boháčková Petra Titul Hospitalizovaný na oddelení OBIT IV. Interná klinika LF UK

Hlavná dg H10 Akútna tubulointersticiálna nefritída Prijatý 02.03.2006 Prepustený

Pacient preložený z iného oddelenia

**Antiagregačná liečba** do 24 hod. pri prep. KI

Aspirín ☐ ☐ ☐

Tiklopidín ☐ ☐ ☐

Klopidogrel ☐ ☐ ☐

**Betablokátor** ☐ ☐ ☐

**Trombolytická liečba**

Čas od príchodu na OUM po začiatok TL minút

**Statin** ☐ KI ☐

**Typ infarktu**

**Systolická dysfunkcia LK**

EF LK <= 40 %

ACEI ☐ KI ☐

ARB ☐ KI ☐

**Stratifikácia**

Závažový test ☐ KI ☐

ECHOKG ☐ Nevýkonané pre krátku hosp. ☐

**Fajčenie pred hospitalizáciou**

O škodlivosti fajčenia počas hospitalizácie poučený ☐

Vypísal - lekár ODD Tóthová Gabriela, RNDr.-Bz

Typ štatistiky I

Poznámka

Stav štatistiky O Stornovať Uzavrieť

**Uzavrieť**

# WHO PATH – Performance Assessment Tool

for internal quality improvement **in hospitals**

- conceptual model
- proposed steps for quality improvement based on measured indicators
- comparison at national and international level
- creation of learning environment

- Quality of Health Systems and Services, Country Policies, Systems and Services Division of CHS  
WHO EUROPE

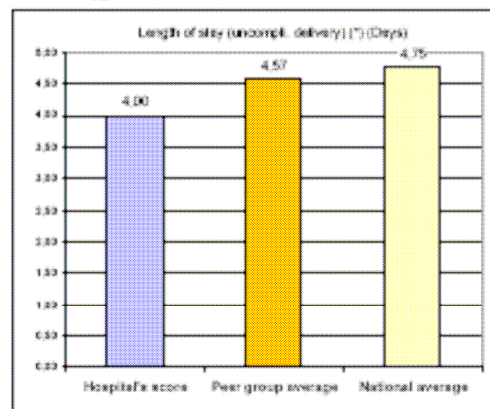
# WHO PATH Hospital dash board

Core Indicator: Length of stay (uncompl. delivery) (\*)

Global rate: 4.00 Days

n:

N:



## Reflective of:

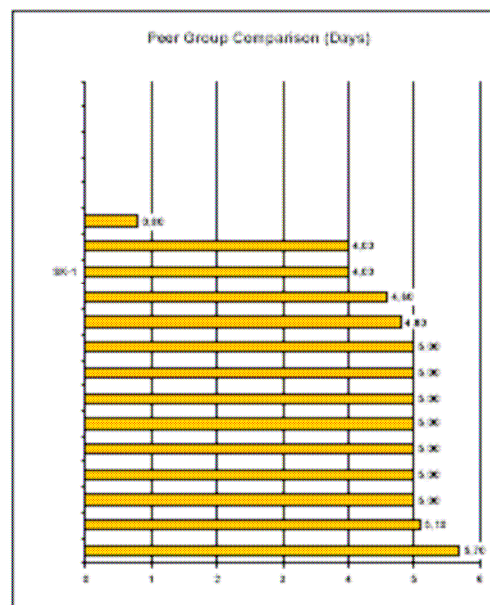
Smooth internal process (i.e. coordination of care within org.) (Production)  
 Discharge preparation, to a lesser extent  
 Complications, to a lesser extent  
 Discharge preparation  
 Patient centredness & Clinical effectiveness/internal coordination of care  
 Clinical effectiveness/outcomes/improved health  
 Clinical effectiveness/safety/quality/complications  
 Clinical effectiveness/process/clinical pathways  
 Responsive Governance/sustained integration/discharge preparation  
 Patient centredness/clinical orientation/improvement

## Formative of:

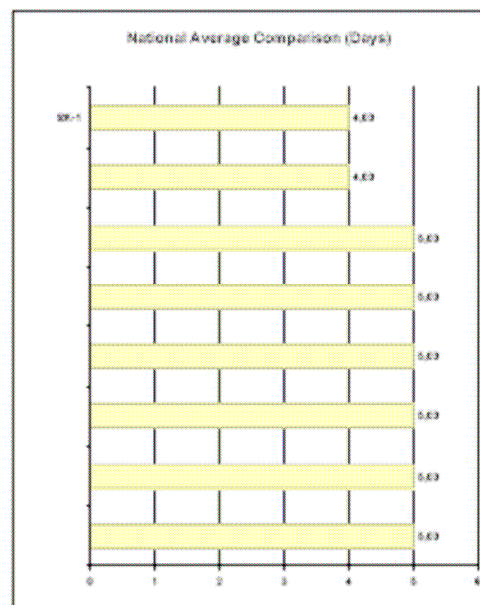
Appropriateness in use of available technology  
 Efficiency, to a lesser extent  
 Complications  
 Efficiency/productivity  
 Patient centredness/clinical orientation/improvement

## Related to:

Discharge preparation  
 Waiting time  
 Readmissions  
 One-day surgery  
 Descriptive transfer rate



Number of hospitals in peer group: 19  
 Number of hospitals without data: 5



Number of participating hospitals: 8  
 Number of hospitals without data: 0

(\*) This indicator is negatively associated with performance.

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# Neurotrauma applications

- distributed register of patients with severe TBI
- evaluation of clinical care provided with automated guideline recommendations
- evaluation of new literature sources and compilation of recommendations and care standards
- collection of physiological measurements and CT scans with automatic interpretation

# Medical/ Health informatics education

- Integrated in
  - undergraduate
  - postgraduate – PHD programmes
  - specialisations - Medical and Health informatics, MPH
  - CME and in job trainings
  - Focused activities - projects components Matra, World Bank, WHO PATH support
- Target groups
  - public health
  - nursing
  - medical specialists and health service managers, other HC professionals

open space for e-learning, e-university applications



# Observed gaps and dilemmas ICT

ignoring needs for continuous financial support for ICT

- in education in general - in underdeveloped critical reasoning and appraisal
- in project preparation and managerial skills
- in lack of integration and safety in health information systems
- in limited willingness to share and benchmark data
- in restricted utilisation of international contacts

# Perspective ICT and grid application

- e-learning
- dynamic and personalize access to bibliographic and other sources of information – text mining
- diseases registers (onco, cardio, metabolic diseases / diabetes, trauma) registers and distributed DBs
- data sharing in anticipated integrated model of patient care
- medical images
- standardisation - the performance indicators linked to clinical guidelines
- aggregation of relevant data in dash boards
- virtual organizations information concept and
- accreditation, certification support

# Conclusions

Potential benefits of Grid information day in SR

- info on new trends
- possibility to see applications in some areas where it works
- link among academics, health care providers, industry and decision makers - with the focus on all three parties of the health care
  - patients, public
  - HC providers,
  - purchasers

Successful application of grid into health care - motivation for health-care professionals for close interdisciplinary collaboration

# Contact

[viera.rusnakova@szu.sk](mailto:viera.rusnakova@szu.sk)