

Specialised commissioning and casemix in rehabilitation - past present and future

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Objectives

- Specialised commissioning
 - **Past, present and future**
- Payment by results
 - **What is it all about?**
 - What are the challenges for rehabilitation?
- Casemix development
 - **Measurement of case complexity**
 - Tools we have developed
 - Implications for costing
- Can we afford complex rehabilitation?
 - **To make the case for resources in specialised services**



Specialised commissioning

- past, present and future



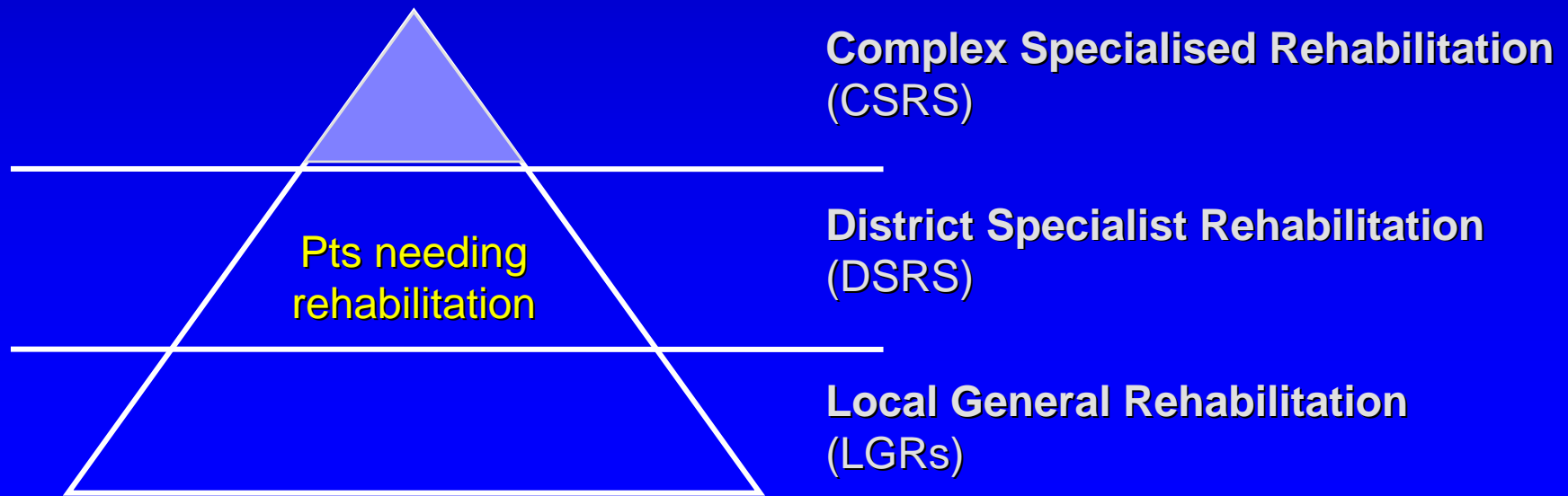
1986 - Royal College of Physicians

- “Physical disability 1986 and Beyond”
 - **Seminal report**
 - Patients 'followed -up' by inexperienced junior hospital staff,
 - Lack of agreed standards of provision in many areas
- Defined 3 levels of service: “Medical Disability”
 - **Local services**
 - Community based services
 - **District services**
 - 1 consultant led-service in every district (250,000 population)
 - **Regional specialist services**
 - More complex and less common conditions conditions
 - Eg head injury

Department of Health

- 2002 - National Specialised Services Definition Sets
 - **Collaborative commissioning arrangements between PCTs**
 - for High-cost / Low-volume Services
 - **2nd Edition: No 7 - “Brain injury and complex rehabilitation”**

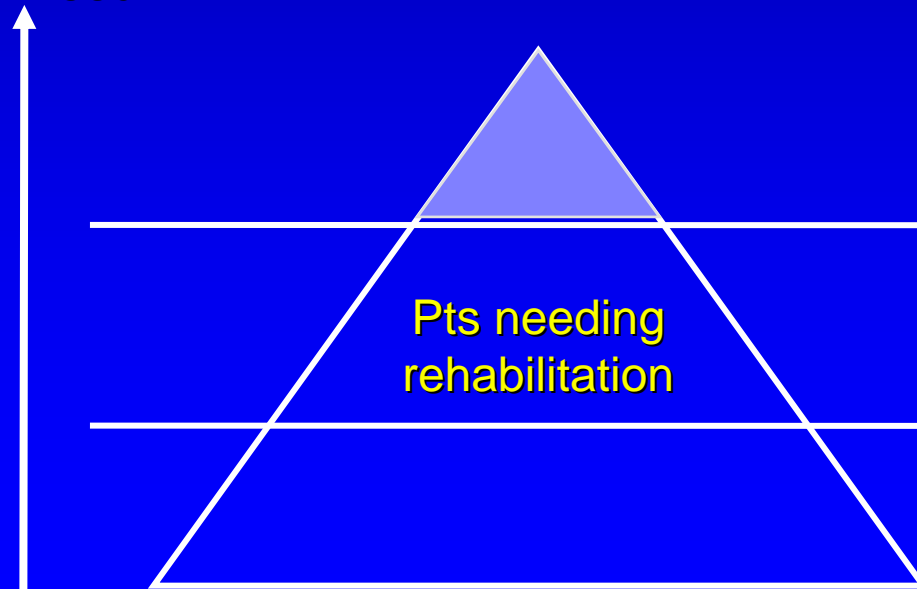
Complexity
of need



Carter report

- 2006 - National Specialised Services Definition Sets (SSNDS)
 - **Specialised commissioning for High-cost / Low-volume Services**
 - **3rd Edition - No 7: “Brain injury and complex rehabilitation”**

Complexity
of need



Level 1: Specialised services
>1 million catchment population

Level 2: Local specialist services
350-750K catchment population
Led by a consultant in Rehabilitation Medicine

Level 3: Non-specialist services
250-300K catchment population
3a: Led by consultants in other specialties
3b: Non medically-led



3rd edition SSNDS

- Closer definition

- **Criteria for different levels of service**
 - Patients who require them

- Service designation

- **By Specialised Commissioning Group**
 - Based on Needs Assessment

- BSRM

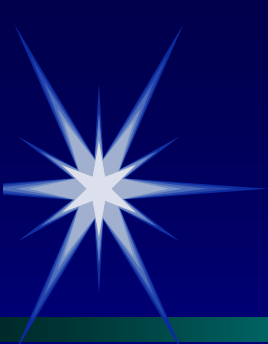
- **Standards for specialist / specialised services**
- **Specific criteria**
 - Staffing, expertise, facilities, training
 - Data reporting – National Dataset for Specialist Rehabilitation
 - Level 1 services: report full dataset
 - Level 2 services: report at least the minimum dataset



London SCG

- Specialised neurorehabilitation
 - **Consortium commissioning**
 - 31 PCTs
 - 9 specialised rehabilitation units

Physical disability units	Cognitive / behavioural units
RNRU Homerton	BIRU, Edgware
RRU, Northwick Park	Lishman Unit, Maudsley
RHN, Putney	Blackheath Brain Injury Rehab centre
NHNN, Queen Square	
Frank Cooksey Unit, King's	Wolfson, St Georges



Payment by Results



Paying for patient care

■ Two main approaches

➤ **Block NHS contract**

- Agree total sum of money for year
- Negotiate amount of activity it will buy
 - No cases treated / occupied bed days
- Pre-set income, regardless of actual activity

■ Cost per volume contracts

➤ **Payment per case treated**

- Pre-agreed price
- Variable income, dependent on activity
 - More cost-efficient
 - More costly unless costs/ activity are capped



Payment by results (PbR)

- Biggest change in financial flow
 - **In the history of the NHS**
 - From block contracts
 - To cost per volume contracts
 - Standard national tariff
 - Same price wherever the patient is treated
- Key questions
 - **What is the unit of payment?**
 - Per treatment episode
 - One price fits all
 - Per day of treatment
 - Rewards inefficiency
 - **What is a fair price for each unit?**



Critical elements

- Categorisation of treatments
 - **'Case-mix classification'**
- Healthcare Resource Groups (HRGs)
 - **Units of treatment eg**
 - Hospital episode for
 - A procedure – eg hip replacement (OPCS code)
 - An illness – eg chest infection (Diagnosis – ICD-10 code)
 - 'Rehabilitation following a stroke' (???)
 - No coding for rehabilitation



How are these counted?

- Hospital Episode Statistics (HES) data
 - **Each hospital admission**
 - Standard set of data collected by each hospital
 - Age, sex, length of stay,
 - Diagnosis (ICD-10 codes)
 - Procedures (OPCS codes)
- Data sent to Department of Health
 - Large data warehouse
 - SUS (secondary users service)
 - Provides DoH with information
 - Activity done by each trust



Costs

■ Reference costs

- **Crude calculation of costs for each episode**
 - Analysed by HRG
 - Average cost of providing each HRG across all Trusts

■ National tariff

- **National price to be paid for each HRG**
 - Based on average reference cost

■ Weighting Adjustments

- **Market Forces Factor (MFF)**
 - Unavoidable cost variations (Geography, staff pay etc)
- **Specialist services**
 - Top up price
 - More complex cases



National tariff

- Includes all costs

- **Of providing treatment spell**

- Direct clinical costs of treatment

- Wards costs, investigations, treatment, care

- Indirect

- Central departments – management, finance, HR etc

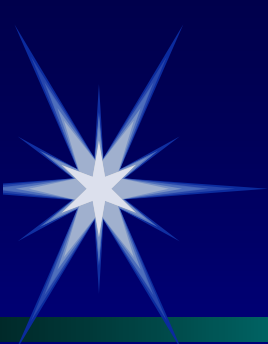
- Overheads

- Capital costs etc

- Commissioning currencies

- **Single episode rate**

- **Per bed day**



Where are we to date?

Challenges of PbR in
rehabilitation



PbR slower than planned

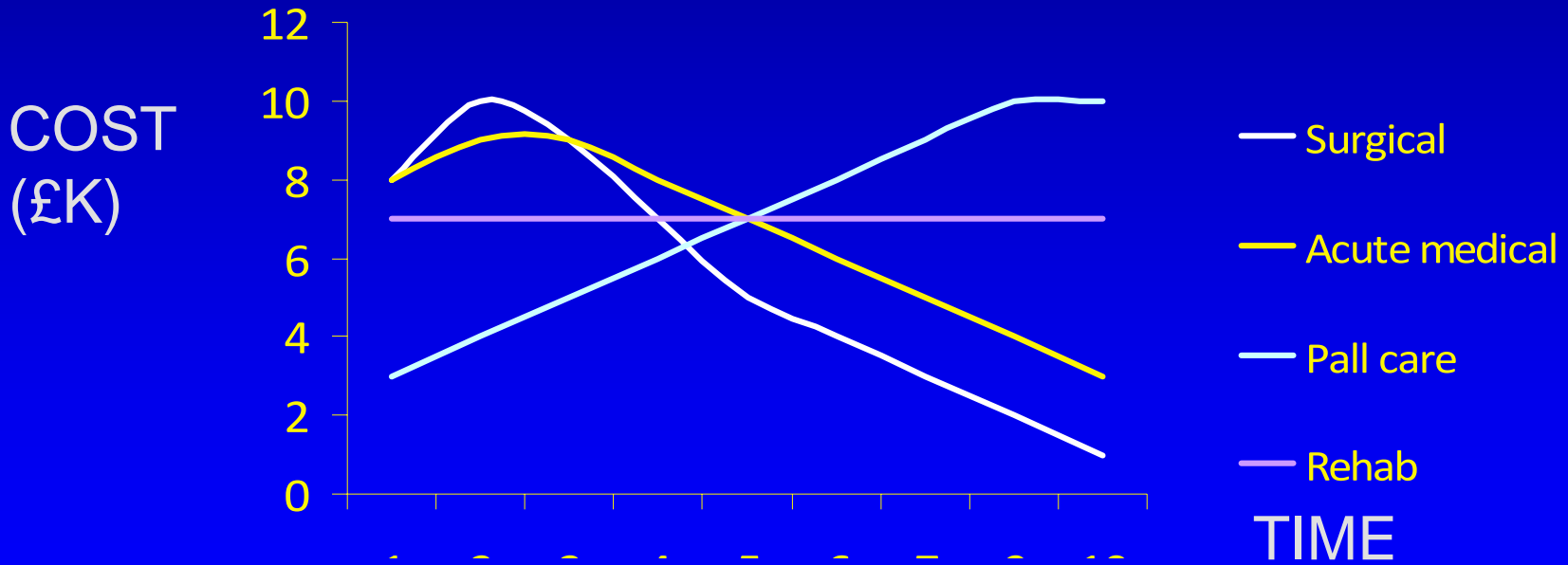
- Expected that by 2005/6
 - **80% of NHS activity included**
- 2009/10
 - **Still not there!**
- Latest version of HRGs version (V4)
 - **Went live for payment 2008/9**
 - <50% HRGs have mandated tariffs
 - Indicative / locally-negotiated tariffs
 - Rehab – not expected until 20012/13



Problems

- **Variation in costs** - Higher than expected
 - **Technical reasons**
 - Incomplete information
 - Variations in coding practice, costing
 - **Actual clinical differences**
 - Level of services offered
 - Expensive investigations, drugs, interventions
 - Complexity of population served
 - Specialisation - Selected group of complex pts
 - **Appropriate currencies**

Cost curves





Example HRGs – Rehabilitation

■ Rehabilitation

- **For stroke**
- **For other brain injury**
- **For spinal cord injury**
- **For neurological disorders**
- **For pain syndromes**

OPCS codes for rehabilitation – z codes

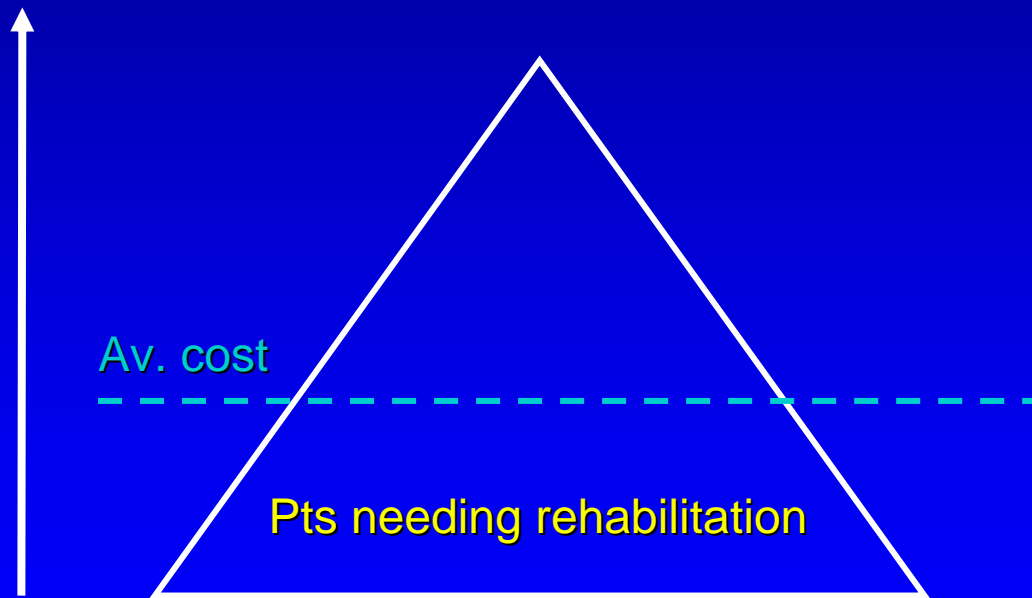
Rarely reported

DoH has little information to inform costing

Wide variation in complexity

Complexity
of need

Reference costs only work, if all units
have the same type of caseload

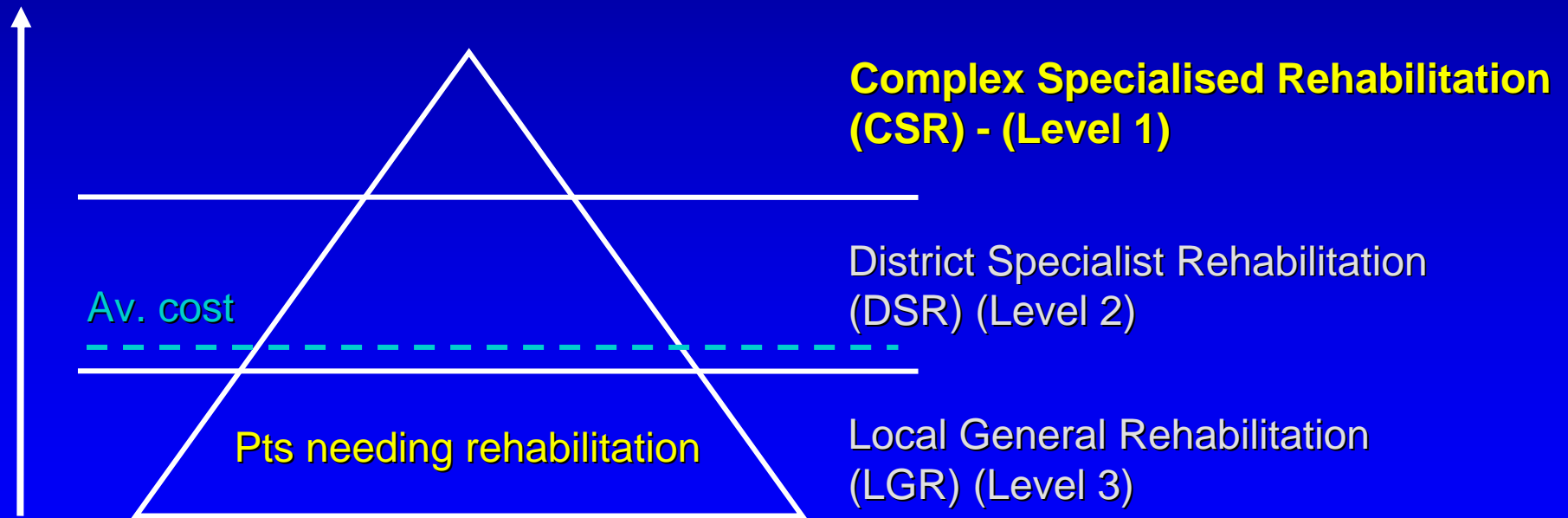


High cost / low volume

Low cost / high volume

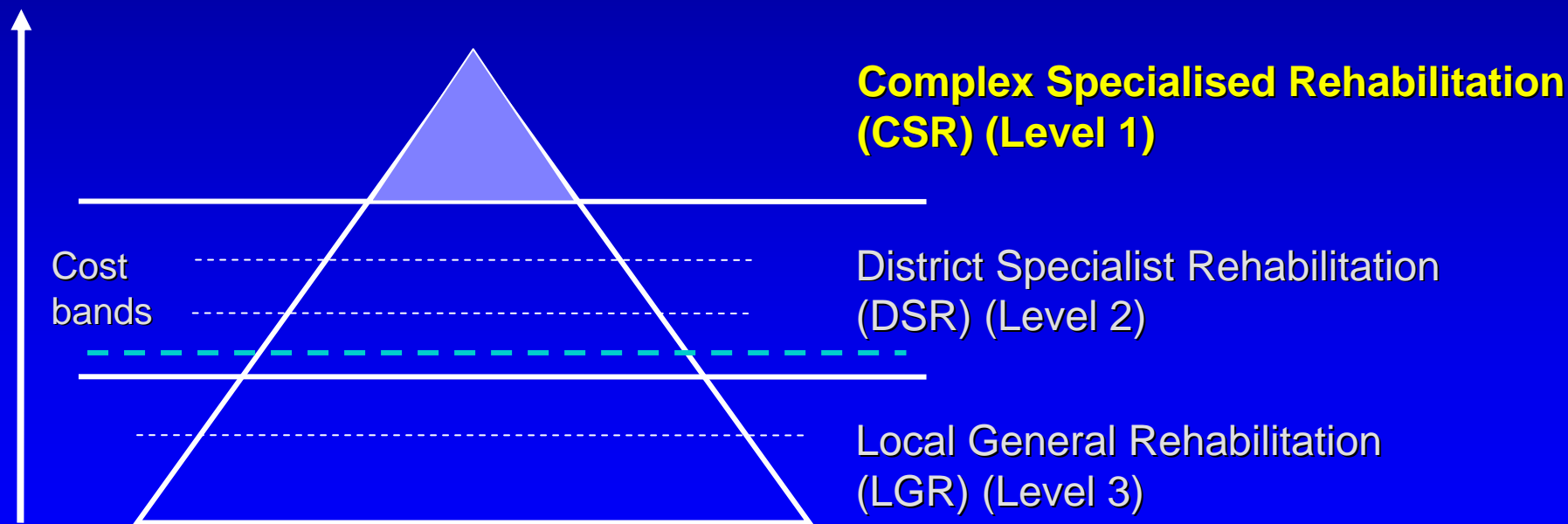
Different levels of service

Complexity
of need



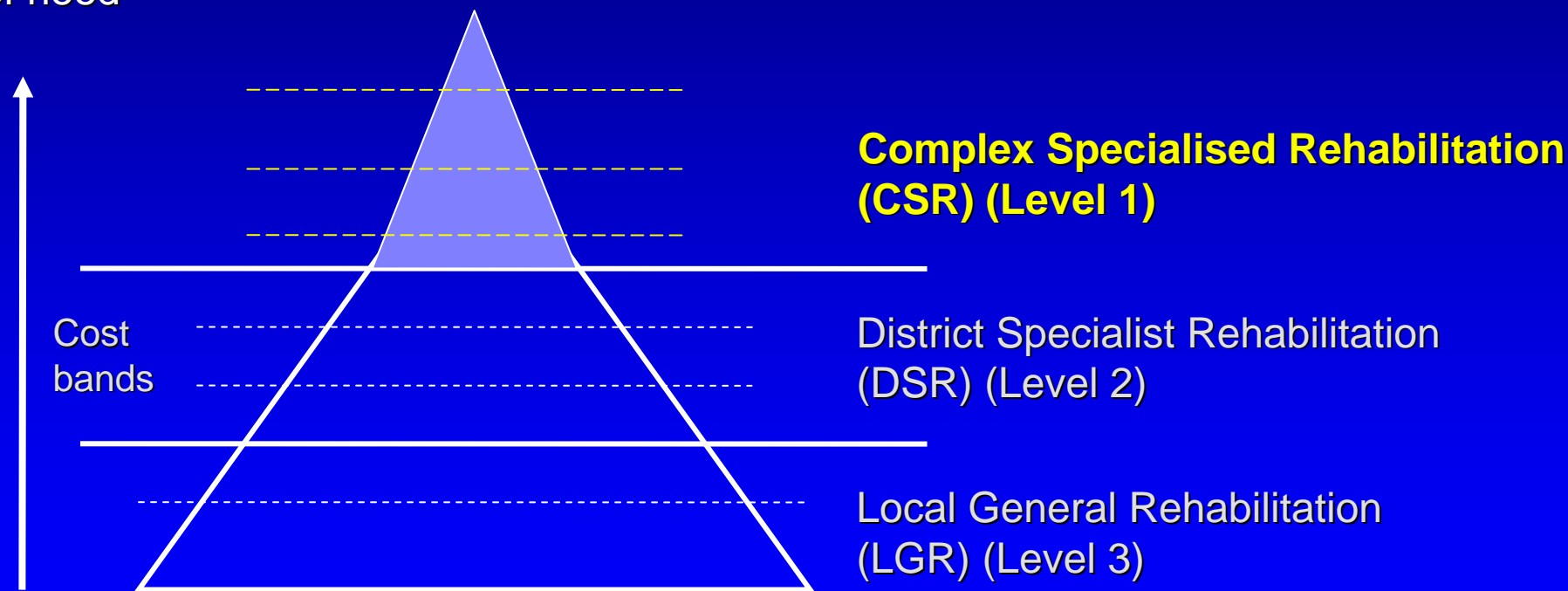
Banding for different levels of complexity in rehabilitation

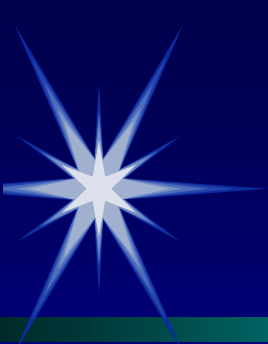
Complexity
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Banding for different levels of complexity in rehabilitation

Complexity
of need





Measuring case load complexity (and therefore costs) in rehabilitation



Experience in other countries

- Diagnosis-related groups

- **In rehabilitation**

- Diagnosis poor determinator of cost

- Function-related groups

- **USA**

- FIM-FRGs

- **Australia**

- FIM / Barthel



Australian Model

- 'Per diem' rates
 - **Designated rehabilitation units**
- Casemix - Weighted payments
 - **Based on complexity of need**
 - Physical dependency
 - Surrogate measure of complexity
 - FIM - functional independence measure
 - The more disabled on admission
 - The greater the cost of the rehab programme
 - Longer admission – more intensive treatment



Function-related models

- Work reasonable well
 - **Early post acute rehab**
 - Emphasis on physical disability
 - Does not always equate with rehabilitation needs
- Work less well
 - Brain injury
 - Walking wounded – cognitive-behavioural factors
 - Low awareness / vegetative states
- Fixed episode payment systems
 - **Poorer functional outcomes**



Neuro-rehabilitation in the UK

- Mixture of approaches
 - **Single incident rehab**
 - **Neuro-palliative rehabilitation**
 - Low awareness states
- State commitment to long-term care
 - **Cost-efficiency of rehabilitation**
 - In reducing the cost of long term care



Factors determining costs in rehab

Basic support and nursing needs	<ul style="list-style-type: none">■ Basic self care■ Special nursing needs
Therapy Needs	<ul style="list-style-type: none">■ No. of different disciplines■ Intensity of input■ Special facilities / equipment
Additional medical needs	<ul style="list-style-type: none">■ Medical support environment■ Procedures / investigations
Length of programme	<ul style="list-style-type: none">■ Bed days



Rehabilitation Complexity Scale

- 16 point measure
 - **C: Basic care needs** (0-3)
 - **N: Special nursing needs** (0-3)
 - **T: Therapy needs**
 - Number of disciplines (0-3)
 - Therapy intensity (0-3)
 - **M: Medical needs** (0-3)

- E.g. RCS 8: (C2 N1 T4 M1)

- Turner-Stokes et al: Clinical Medicine 2007; 7 :593-9



UK national survey

- 45 units
 - **20 'complex specialised' services**
 - **25 district specialist services**
- Cross sectional survey
 - **1 week**
 - **RCS scores for all pts on unit**
 - 5-47 pts scored
 - Total 677 scores

Preliminary results

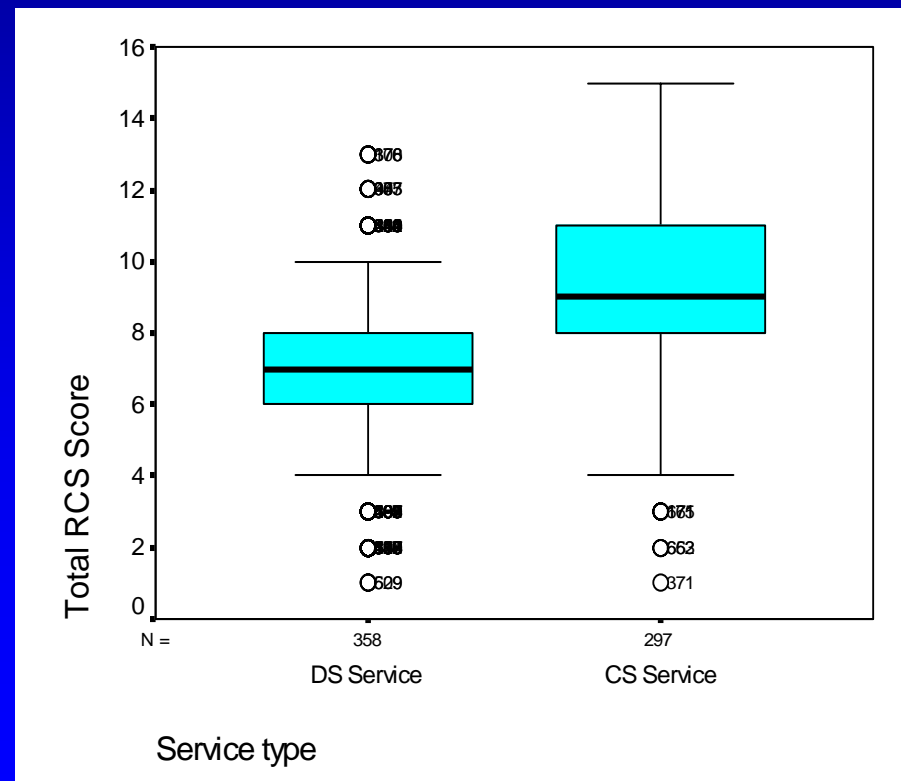
- Complex Specialised (CS) vs Specialist (DS) Rehab Services
- No service features distinguish them

- Proportion of complex cases:

Median RCS (IQR)

- **CSR:** 9 (7-11)
- **DSR:** 7 (6-8)

Mann Whitney
 $Z = -9.3, p < 0.0001$





So...

- We can identify pts
 - **With complex needs**
- But how much extra
 - **Do they actually cost to treat?**
 - What is a fair price for this activity?
 - How should they be commissioned?
 - How is this built into policy?



EWG - HRGs in rehabilitation

■ EWG - Expert Working Group

➤ **Established 2005**

➤ **HRGs version 4**

➤ Rehabilitation HRGs identified

➤ Unbundled from acute treatment, when sole purpose of admission

➤ Further work while HRGs v 4 introduced for acute care

➤ **Recently reinstated**

➤ “Expert Reference Panel” – PbR representation - more clout

■ Development

➤ **Accept ‘per diem’ commissioning currency**

➤ Reference costs collected separately for each service level

➤ 2007/8 data – DoH data inaccurate

➤ **Develop costing methodology based on patient level costing**

➤ Banded tariffs based on Rehabilitation Complexity Scale



UKROC Minimum dataset

- Each case episode (pseudonymised)
 - **HRG**
 - Diagnosis (LCD-10)
 - **Length of stay (days)**
 - **RCS**
 - C,N,T, M scores itemised
 - On admission and discharge
 - **Outcome measure**
 - FIM or FIM+FAM (or Barthel Index for level 2/3)
 - On admission and discharge
 - **Cost of admission (if known)**



Costing tools

- Key costing factor staff time (70-75%)
- Northwick Park Dependency Scales
 - **Nursing Dependency Scale (NPDS)**
 - Dependency on nursing time
 - Translates to hours of nursing time
 - **Therapy Dependency Assessment (NPTDA)**
 - Therapy disciplines involved and intensity
 - Translates into hours of therapy time
 - **Designed for neuro-rehabilitation settings**
 - Inform patient-level costing
 - Banding for more complex patients



NPDS

Turner-Stokes et al: Clin Rehabil 1998; 12: 304-316

- Ordinal scale of nursing dependency
 - **Basic Care Needs (0-65)** }
 - **Special Nursing Needs (0-35)** } **0-100**

- Dependency on nursing time
 - **For common tasks**
 - No people required to help
 - Time taken
 - **Includes cognitive issues**
 - Safety awareness, communication,
 - Behavioural management, psychological support

- Calculates staff hours for care and nursing
 - **Basic care needs – trained health care assistant**
 - **Special nursing needs – qualified nurse**



Therapy dependency (NPTDA)

Turner-Stokes et al: Clin Rehabil 2009; 23: 922-37

- Ordinal scale of therapy dependency
 - **Total range 0-100**
 - **28 items – each rated on a scale of 0-4**
 - Based on no of therapists and frequency of intervention

- Records all patient related activity:
 - **Direct hands-on therapy interventions**
 - Physical, cognitive, communication, psychological etc
 - Discharge planning
 - **Indirect care**
 - case conferences, report etc

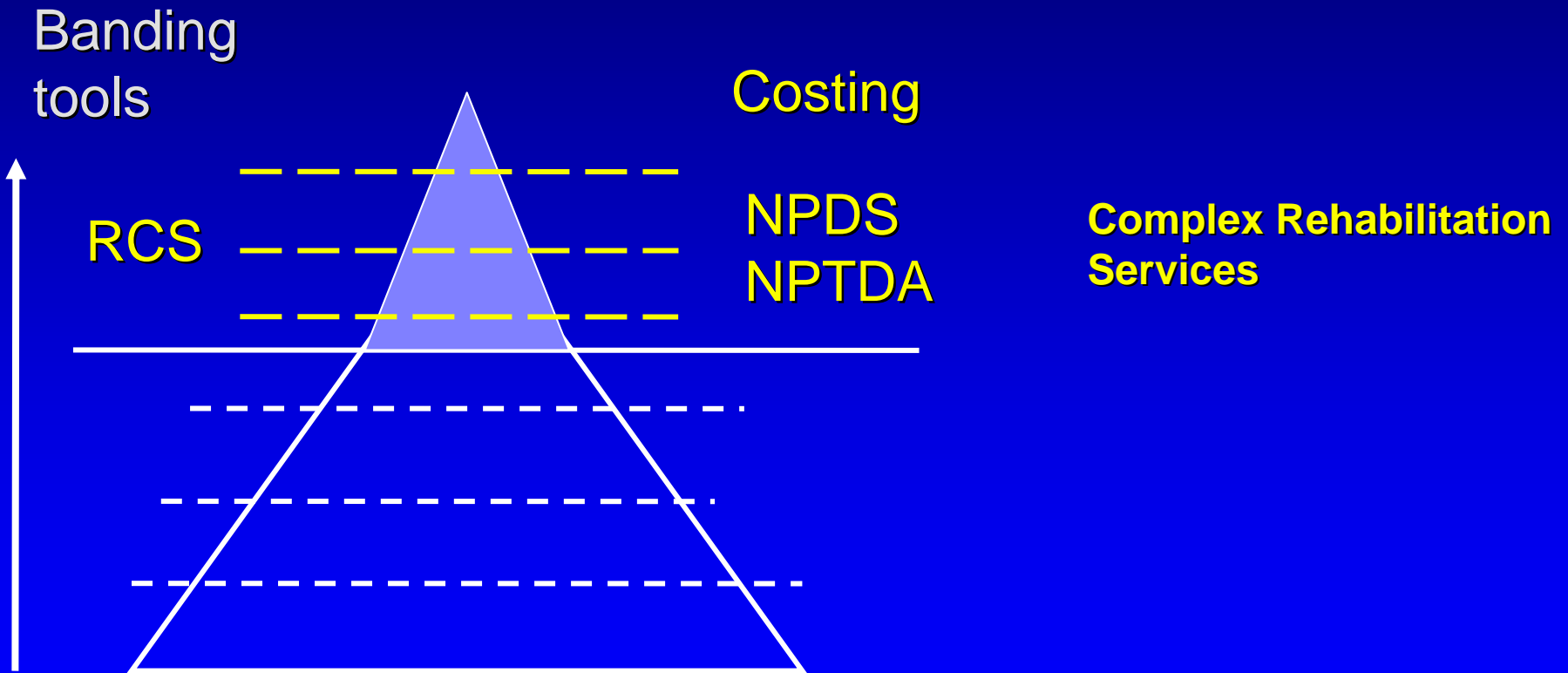
- Calculates therapy hours
 - **Hours for each discipline**
 - **Total hours**



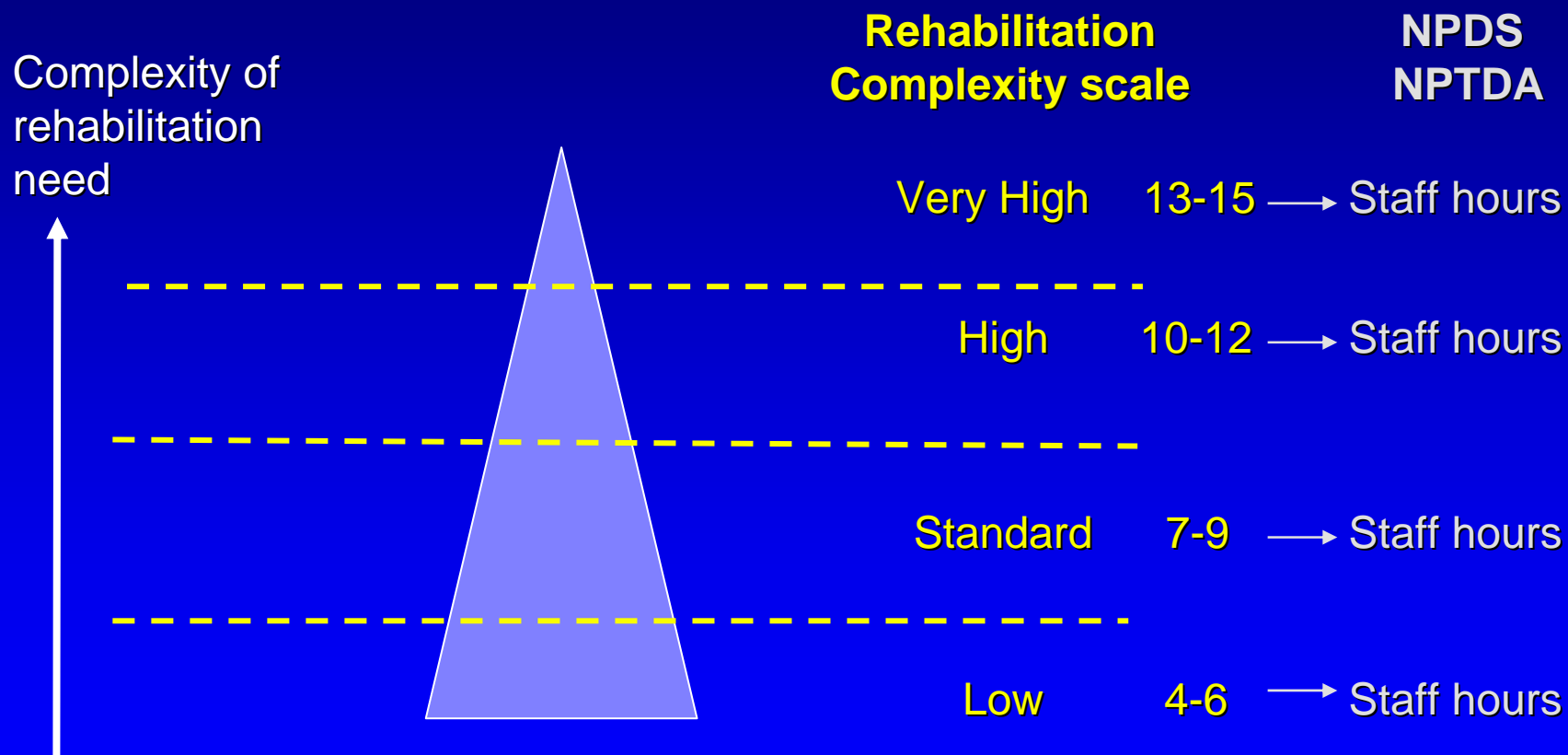
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Additional medical needs	<ul style="list-style-type: none">■ Medical support environment■ Procedures / investigations	
Length of programme	<ul style="list-style-type: none">■ Bed days occupied	LOS

Cost banding



What are the relative proportions of staff time, spent with each complexity group?





Analysis from one service

- Regional Rehabilitation Unit
 - **Tertiary in-patient service (Level 1)**
 - Complex neurological disability
 - Younger adults – 16-65 years
- Fortnightly prospective data collection
 - **Serial parallel recordings**
 - RCS, NPDS, NPTDA
 - **Since June 2006**
- Cohort analysis
 - **June 2006 – Dec 2008 (2.5 years)**

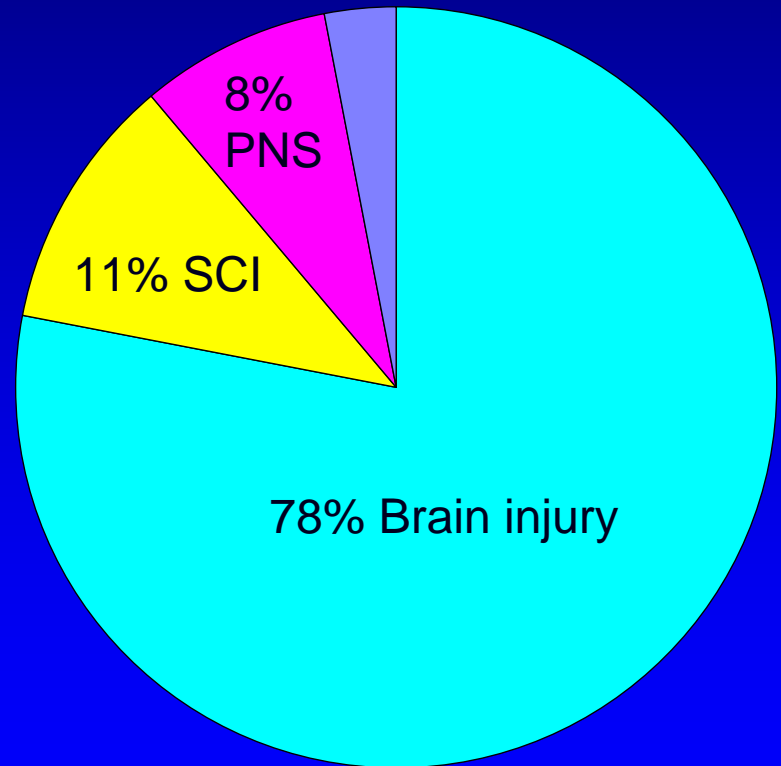
Study Sample

■ Cases n=179

- **Mean age** 44.5 (SD 14.8)
- **M:F** 110/69
- **LOS (days)** 78 (SD 64)

■ 1208 sets of rating

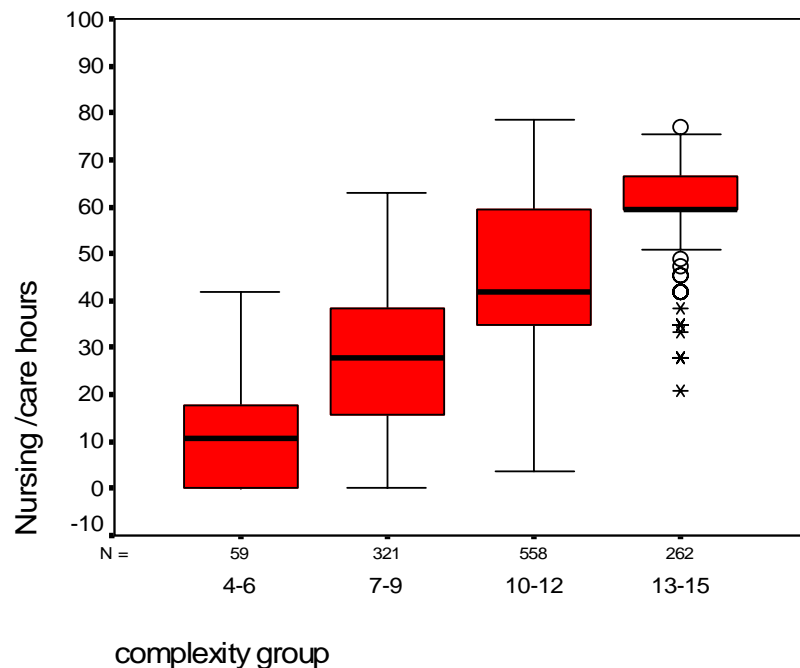
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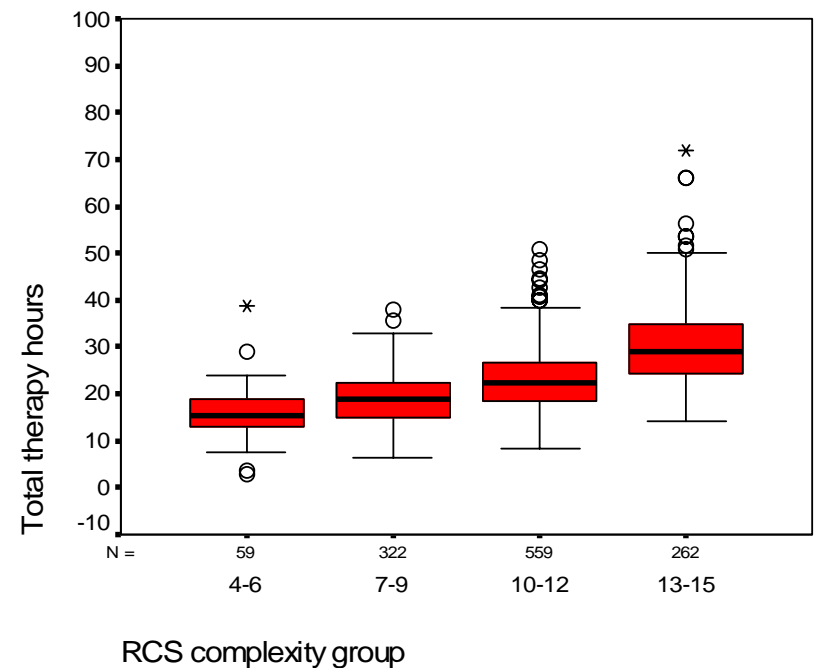
Cross-sectional analysis

Total staff time analysed by complexity group

Nursing hours/ week



Therapy hours/ week





Median hours by group

RCS category	Low	Medium	High	V high
Nursing/care hours/wk	10	28	42	60
Therapy hours/wk	19	20	24	31
Total staff hours/wk	30	48	66	91
Relative proportion	0.6	1.0	1.4	1.9



Developing weighted cost bands

■ Calculate

➤ **Mean bed-day costs**

- Fixed -central / overheads
- Variable – primarily staff costs

■ Then

➤ **Weighted bed day costs**

- To take account of differential costs
 - Of treating complex patients
- Weight applied to the variable portion of costs
 - Based on relative proportion of staff time



Poor man's Patient level costing (PLICs)

Calculation of mean bed day costs

**Total annual
unit costs**

÷

**Total
occupied
bed days**

=

**Mean
Bed day
cost**

75% variable
25% fixed

75%	Direct (variable) Staff pay costs Non-pay ward costs
10%	Indirect (fixed) Central trust costs
15%	Overheads (fixed) Capital etc

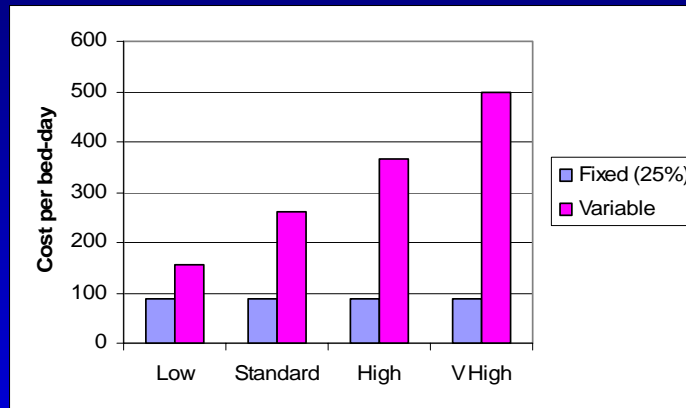


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Weighted costing model

Base bed-day rate
£400 per day



	Factor	Fixed Portion (25%)	Variable Portion (75%)	Total Cost Per Bed-day
Low	0.6	£100	£180	£280
Standard	1	£100	£300	£400
High	1.4	£100	£420	£520
Very high	1.9	£100	£570	£670



Can we afford to provide this
complex rehabilitation?

Can we afford not to?



Highly dependent patients

4-month admission for rehabilitation

Care package

Admission:

Two live-in carers (£2500/wk)

Discharge

1 live-in carer (£1250/wk)

Cost of rehab £70,000

Cost offset in 14 months



5 year Cohort data: 2000-2005

297 consecutive admissions

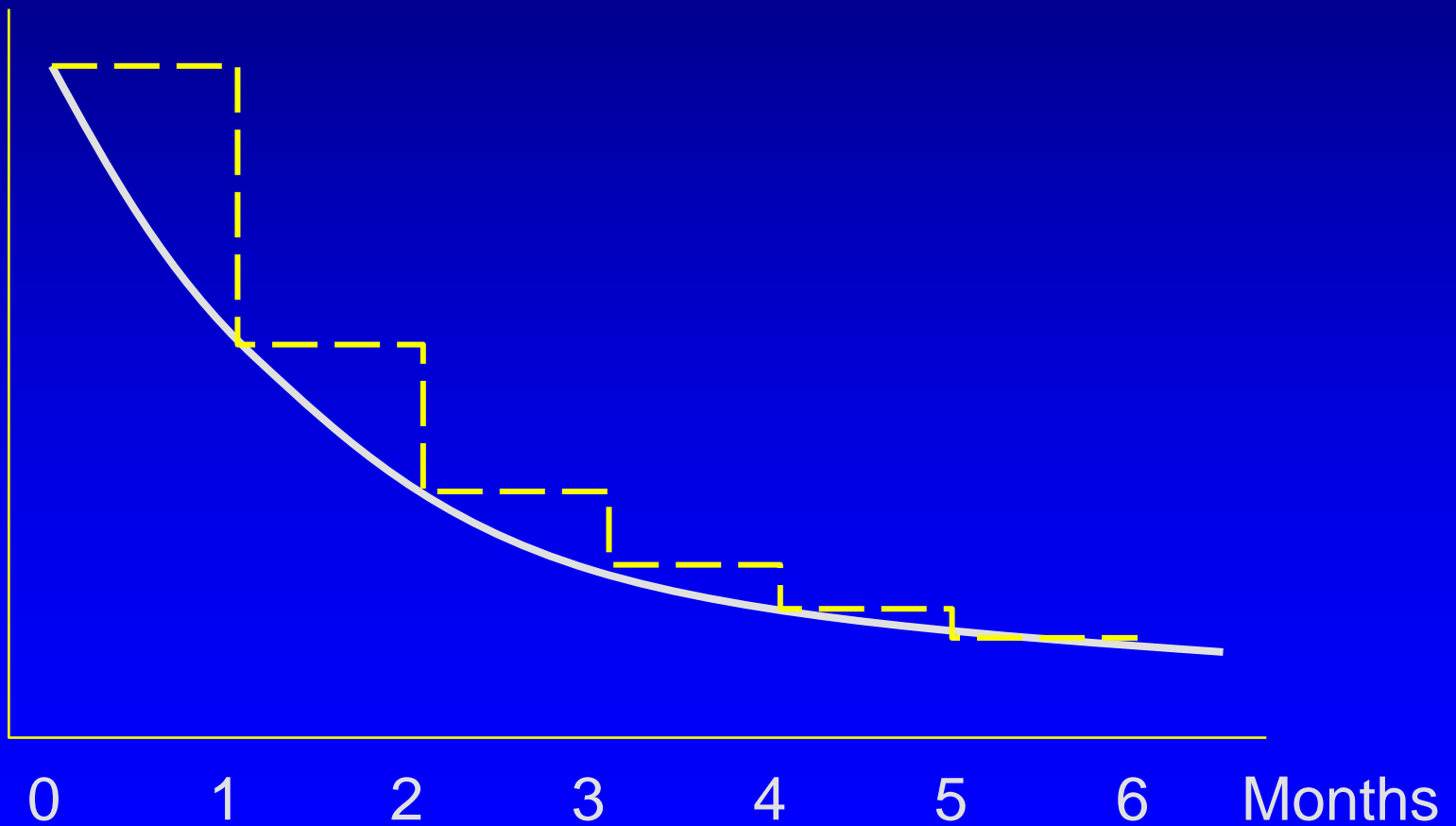
Turner Stokes et al JNNP 2006; 77: 634-639

Dependency on admission	High (NPDS > 25)	Medium (NPDS >10-24)	Low (NPDS <10)
Initial cost of rehabilitation	£41,782 *	£27,774*	£17,226*
Mean LOS	155 days	104 days	71 days
Mean weekly savings in care costs	£673 per week	£290 per week	£83 per week
Time to offset cost of rehabilitation	12 months	17 months	41 months

* Non-weighted bed-day costs

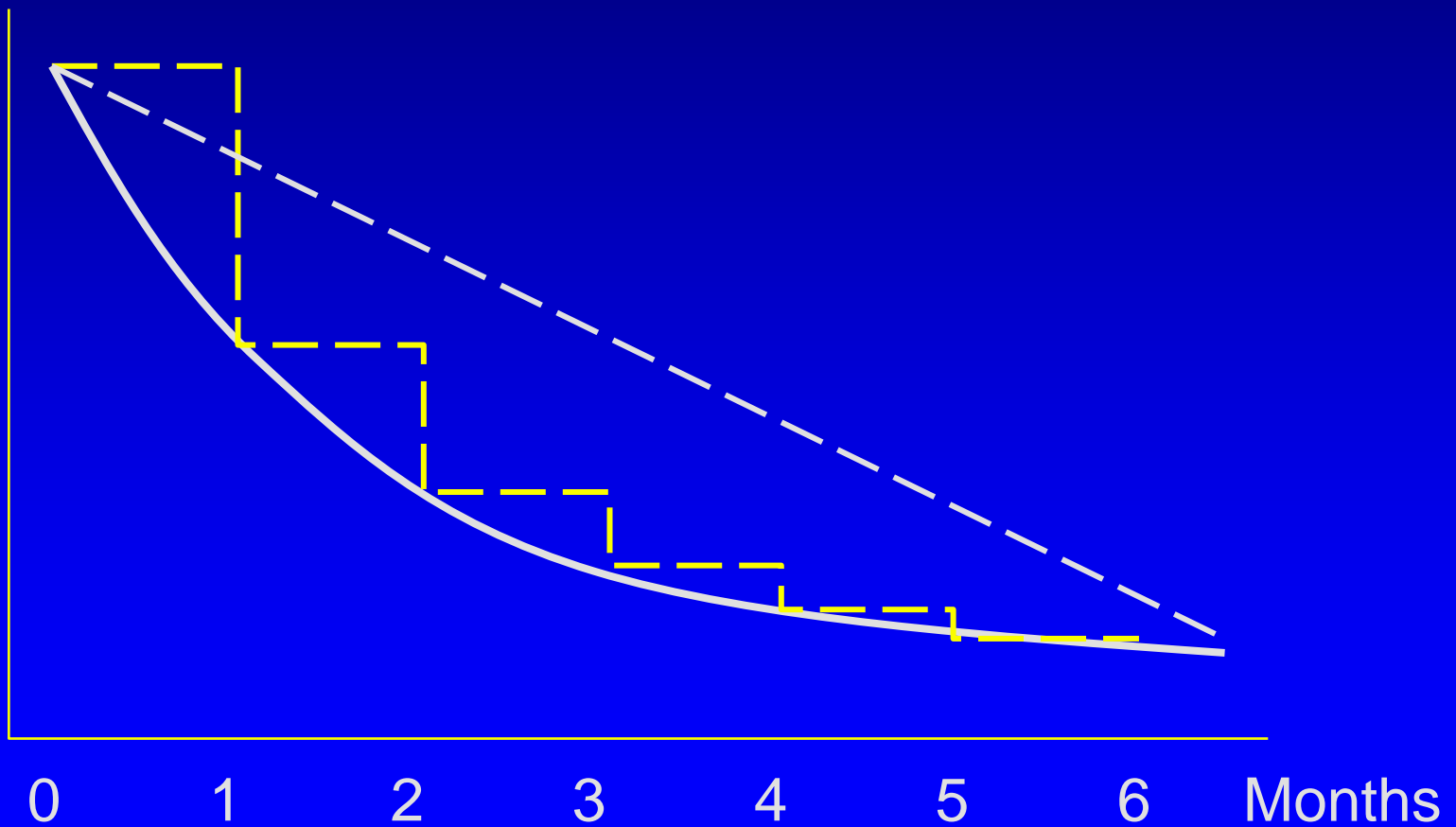
Diminishing returns

Cost of care

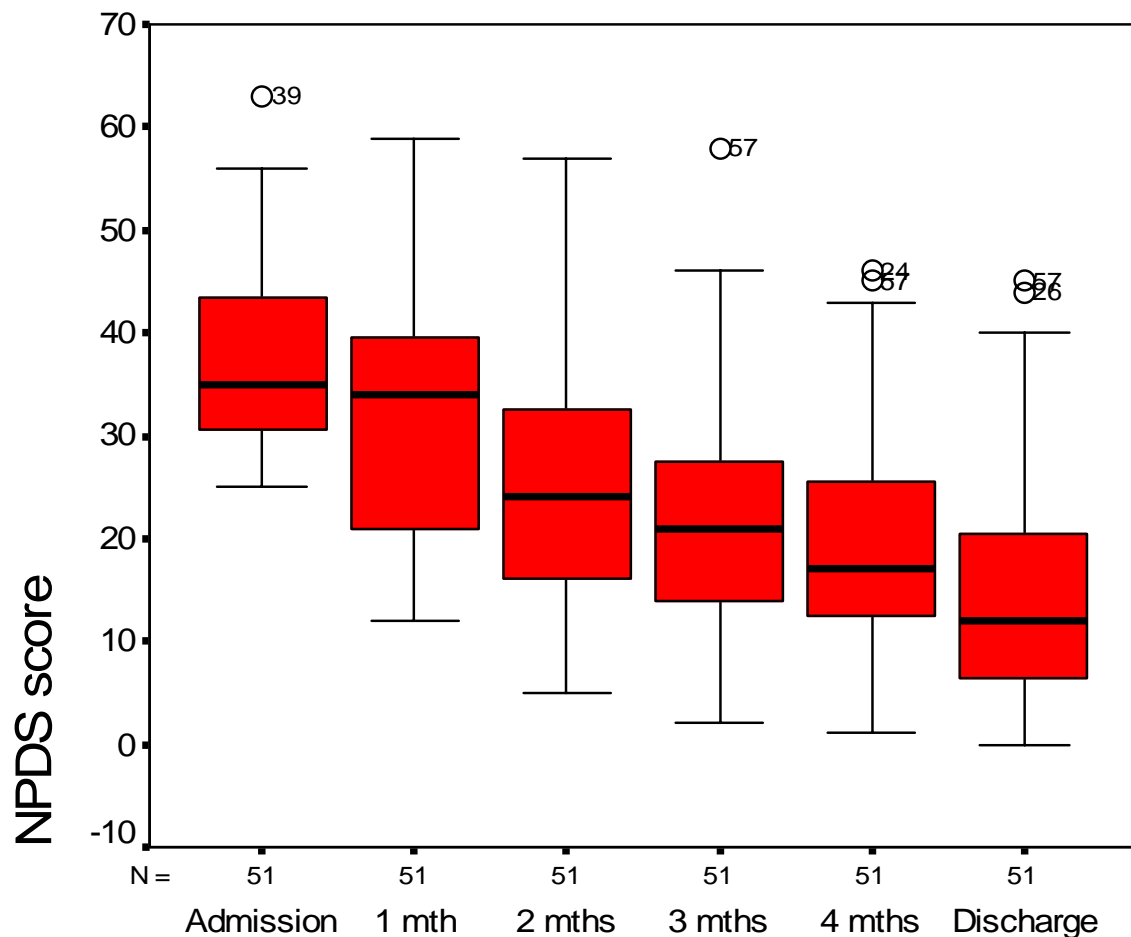


Diminishing returns

Cost of care



Cost-efficiency of long stay pts



Long stay pts:

- NPDS > 25
- Stay > 125 days

n=51

Mean cost £52K
(LOS 6 months)

Savings in care
£950/week

Offset 14 months



Case studies

Complex patients

Prolonged in-patient rehab




DP – aged 17

■ RTA

- **Severe brain injury**
- **Crushed pelvis**
- **Minimally conscious state**
 - Severe behavioural problems
 - 1:1 nursing care for 4 months

■ LOS 11 months

- **£120K – excluding 1:1 nursing**
 - Care costs: £3585 - £2397
 - Weekly saving £1186
- **Time to offset cost**
 - 25 months



GF M – aged 22

- Fell on building site
 - **Severe TBI**
 - **Multiple fractures**
 - **Degloving left arm**
- Coma – MCS
 - **Severe physical aggression**
 - **Contractures**
 - Physios unable to get near
- LOS 10 months
 - **Cost £146K**
 - Care costs: £2216 - £36
 - Weekly saving £2180
 - **Time to offset**
 - 11 months



Most complex cases

■ Case-by-case funding

- Continuous dialogue with funders
- Relies on good serial data
- **Require validated assessments for**
 - Input - level of intervention
 - To provide accurate costing
 - Outcome
 - Meaningful change
 - Value for money



Outcomes

- Value for money

- **Functional Independence**

- Barthel Index, FIM ±FAM

- **On going cost of care**

- NPDS / NPCNA

- **Person centred outcomes**

- Goal attainment scaling (GAS)

Banding for different levels of complexity in rehabilitation

Complexity
of need

Inputs

Outcome

Banding
NPDS
NPTDA

FIM \pm
FAM

**Complex Specialised Rehabilitation
(CSR) (Level 1)**

Banding
RCS

BI
GAS

District Specialist Rehabilitation
(DSR) (Level 2)

Local General Rehabilitation
(LGR) (Level 3)

