

Pathway-based metrics to support the second stage NHS Review and drive quality improvement

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Introduction

The Darzi NHS Review demands a new approach to the delivery of health services fit for the 21st century based on 'alignment and improvement': this should then drive a new approach to quality improvement metrics. The Review puts patients at the centre of everything we do; their individual or collective journeys/pathways through health services should be a good experience, creating good outcomes.

Patients' outcomes will only be as good as the weakest link in their pathway and so the new metrics need to identify these weakest links. Then patients, clinicians and managers need to reflect, innovate and evaluate to create improvement. The lessons learnt should then be spread through organisations to create a culture of learning and continuous improvement.

Patients, providers, commissioners and regulators are all interested in ensuring that public funds are spent wisely. They want the right treatments to be given to the right patients by the right people - at the right time and place, in the right way, and for the right reasons.

So it is important for service providers to be able to demonstrate the "quality" of their services. By this is meant their ability to deliver on these expectations, and equally important, their ability to improve when their services fall short.

The majority of people working in the health service understand the importance of homeostasis in biological systems to maintain equilibrium, as well as the principles of evolution which depend on constant change / experimentation for the characteristics of "the fittest" to be taken forward to future generations. Yet similar thinking has not been applied to the health service, which itself could be likened to a complex biological system.

In the future, the NHS needs to create a culture where feedback is used to continually innovate, evaluate and take forward learning at both an individual and an organisational level.

Why is this topical?

The NHS Review. The NHS is 60 years old. The Darzi Review is asking whether the current structure is still fit for purpose in the 21st century. Each

SHA has reviewed its services, and is drawing up plans for change. One of the Darzi pledges (May 2008) is that new services will be better than current ones. This obviously requires some form of measurement.

World-class commissioning. It has been acknowledged that current commissioning capacity is inadequate and therefore is undergoing significant investment. The hope is that future resources will be used to shift from hospital to community provision, from interventions to prevention, as well as driving clinical excellence.

Regulation. Regulatory agencies have tended to focus on organisations rather than patient groups or pathways/networks of care. Increasingly this approach will need to be balanced with more clinically orientated measures demonstrating safety, good patient experience and good outcomes.

Revalidation. Revalidation focuses on the competence of clinicians, but competent individuals need to work in competent systems if they are to achieve the best for their patients. Similar arguments hold true for training -it cannot occur outside a good clinical delivery system. Revalidation requires measurement of service performance; indeed, demonstration of personal or service improvement may become part of revalidation.

Service accreditation. Increasingly commissioners will require services to meet certain criteria. Integrating hospital and community services is at the heart of the "Kaiser approach", which enables organisations to continue providing services, but in different settings, without the loss of organisational income. This will require a set of metrics different from data relating to traditional hospital-based activity.

All these "drivers" require some form of indicators to measure the quality of services and their value to patients. Without such indicators it will be difficult to know where to invest new resources and to decide whether innovations and changes to service delivery have been successful.

Achieving the best outcomes for patients and their families requires close and cooperative working relationships between the NHS and other organisations - for example social care, the community/voluntary sector, and children's education services. These agencies need to have closer working relationships and share best practice to develop standards, measures and quality improvement to ensure optimum health outcomes and service quality.

The Modelling the Future approach

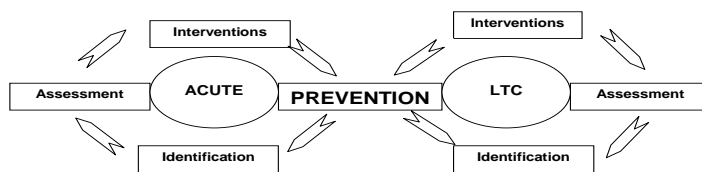
The study Modelling the Future, led by the Royal College of Paediatrics and Child Health (RCPCH), stresses the importance of patient journeys, with parts of the pathway being delivered by teams working cooperatively within a wider managed network.

The generic framework for an acute (primary) condition pathway contains four components:

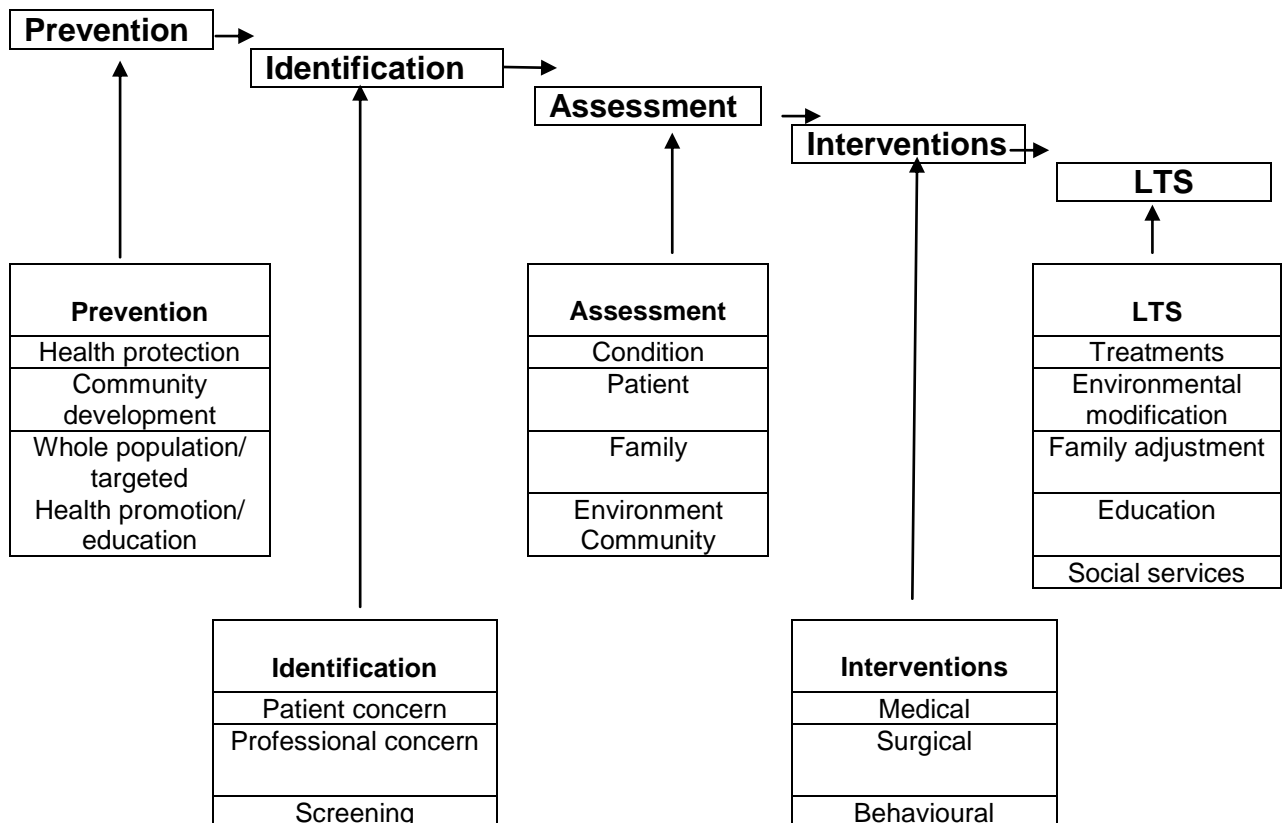
1. Prevention
2. Identification
3. Assessment
4. Intervention

Long-term support (if the intervention is not curative) can be seen as a series of pathways to prevent, identify and assess and intervene focusing on the secondary complications of the primary condition.

That dramatically it could be represented as follows



Each component of the pathway may require a different approach, depending on the condition and its ideal treatment. A generic framework, appropriate to all ages and all conditions, might look like this:



Surveillance

AHPs/others

Fig.1 Examples of interventions to support the components of the pathway (LTS = long-term support)

Worked example - meningococcal septicaemia

A pathway approach for meningococcal septicaemia might involve:

Short-term care

- *Prevention* - through immunisation
- *Identification* - early identification by parents/adolescents through the recognition of the importance of a non-blanching rash
- *Assessment* - appropriate clinical assessment by first contact practitioners
- *Management* - early access to antibiotics; access to advanced life-support systems in emergency departments; transport/retrieval to intensive care (if necessary).

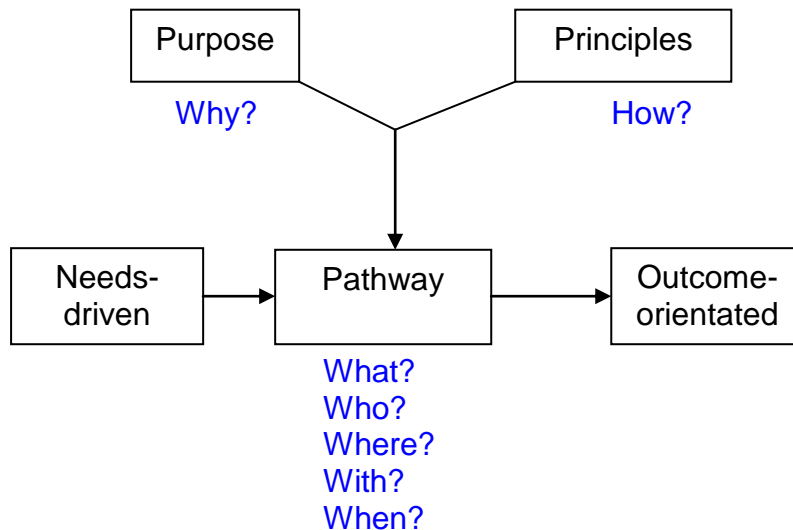
Long-term care

Following short-term recovery from meningococcal septicaemia, rehabilitation services for the 10 per cent with residual problems (often physical and hearing disabilities) will be required - leading into a long-term condition pathway. A good functional clinical outcome will depend on all the parts of the pathway working well together.

Management of long-term conditions uses the same thinking, but orientates the approach to prevention, identification, assessment and interventions to reduce the impact of secondary complications of the primary condition. An example would be diabetic care where ophthalmological complications can be prevented through rigorous dietary/insulin regimes, with screening programmes to identify diabetic retinopathy, leading to more detailed assessment of visual function and laser treatment for proliferative retinopathy. If this is not entirely successful, long-term support services for visual impairment would be required.

Regardless of the service, the starting point is a clarity of purpose - what the service is to achieve, how it is to achieve this (a clear philosophy and principles) (see the new NHS Constitution), with each step within the pathway being evidence-based, delivered by competent people, in the right place, at the right time, and all supported with the right resources.

This approach maps neatly onto the questions who?, why?, what?, where?, when? and how?, plus an additional question – with? (meaning with what support services):



Potential standards

There are a number of different approaches in the literature to the development of standards/measures. A combination of a systems approach (Peter Checkland) with elements of the Donabedian approach and have been combined below, as they seem most applicable to health services requirements.

Standards framework			
The question	Aim	NHS interpretation	Elements
Why?	Right patient	Purpose	Improve health Reduce inequalities
How?	Right way	Philosophy / culture	Family friendly Involvement/anticipation
What?	Right thing	Evidence	Guidelines Protocols
Who?	Right people	Workforce capacity	Numbers Competence
Where?	Right place	Place	Hospital/community/home microenvironment
With?	Right support	Support	Clinical Administrative
When?	Right time	Flow	Access Times

Structure, process and outputs

Structure, process and output are the three elements of any one component of the pathway. For example, the question “what” requires the right things being done, which in turn depends on the available evidence. *Structure* might include the availability of protocols or guidelines; *process* would be evidence of their use, and the *output* would be evidence of their effect.

Likewise for workforce the *structure* would be the numbers of people, the *process* would be a demonstration of their competencies, and the *output* would be measurement of their impact.

For place of delivery *structure* might be about offering community based clinics, *process* about their use and *output* their benefit over alternative provision (for example fewer DNAs).

Logically if evidence of good effect (output/outcome) could be demonstrated there would be no need to demonstrate structure or process. It would be assumed these were in place and working well to achieve the good output (e.g. high immunisation uptake assumes all the elements of the service are working well together – more detailed analysis is only required with poor uptake rates).

Although this is a robust framework, having three measures based on structure, process and output, for the four to six elements that make a good practice, and for the five components of each pathway. will clearly create an overwhelming mass of details that might well obscure the important factors.

Good standards represent what is important to patients, clinicians and managers of the service. Where there is agreement between these three “stakeholders” and when that standard can be represented by a measure that is collectable in practice, it is likely to be a good contender. The best measures identify the outputs from the weakest points in the system and then ideally the same measure can also act as an indicator of improvement.

Good measures

Measures, on their own, rarely lead to change. Data for different measures need to be compared between different services and possibly adjusted for case mix or other confounders, and then presented in a way that informs rather than confuses. Measures that *matter* must have both *meaning* and the ability to *motivate* improvement. To be successful this requires patient and clinician involvement in an organisation culture which is supportive rather than blaming (ref. the learning organisation).

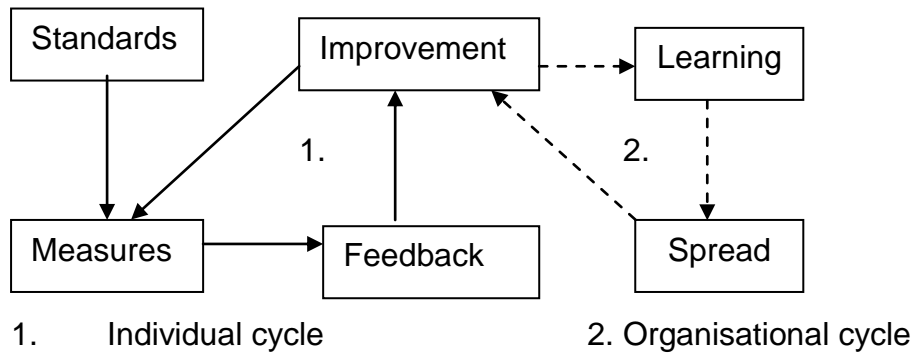
See appendix for criteria for good measures

Feedback, improvement and learning

In comparison to the clinical interventions there is a relatively small literature on which to base service improvement. However, where there is agreement between patients, clinicians and managers that a change is likely to result in improvement it is more likely that will be successful. Information to support this conclusion still needs to be evaluated, peer reviewed and published in order to develop a robust evidence base.

Such success will be a learning experience at both individual and at an organisational level. Individuals have a professional responsibility to strive for

continuous improvement, and organisations have a responsibility to use that learning and spread it to others to enable them to produce better outcomes.



Conclusion

Comparable metrics based on pathways and networks, offer a real opportunity to engage patients, clinicians and managers in the process of improving future services - as the concept of improving the weakest link is both intuitive and practical.

Further work needs to be undertaken on the metrics in order that they have meaning, motivate change and really matter. The concept of a bundle of measures to represent the functioning of the whole network needs to be explored further.

Overall the concept of those commissioning, providing and regulating services all being aligned to improvement based on pathways and networks is entirely compatible with the vision expressed in the NHS Review.

Appendix Examples

Meningococcal septicaemia (childhood)		
Component	Action/output	Measures
Prevention	Immunisation	Population uptake of immunisation.
Identification	Adolescent awareness	Proportion of 16 year olds receiving health education
Assessment	First contact	% GPs with paediatric training
	Second contact	% emergency department staff with APLS training
Interventions	Antibiotic access	Time between rash recognition and antibiotics
Long-term support	Hearing impairment	% assessed as discharge
	Speech and language therapy	% access within 6 weeks

Diabetes care -retinopathy management		
Component	Action/output	Measures
Prevention	Normoglycaemia	% HbA1C <value
Identification	Retinopathy screening	% screened
Assessment	Retinopathy assessment	Yield from screening
Interventions	Laser treatment	% diabetic population receiving treatment (type 1 and type 2)
Long-term support	Visual aids	% access

Sensorineural hearing impairment screening programme		
Component	Action/output	Measures
Prevention	MMR	% MMR uptake
	Genetic counselling for familial hearing impairment	% genetic counselling and uptake
Identification	Neonatal hearing screening	1. Screening uptake 2. Yield from screening
	School entry screening	1. Screening uptake 2. Yield from screening
Assessment	Hearing impairment	N % hearing loss >50db
	Age at diagnosis	N % diagnosed 6/12
Interventions	Hearing aids	1. N % 2. age at fitting
	Cochlear implants	1. N % 2. age at operation
Long-term support	Speech and language therapy	Language measure@ age x
	Educational support	Educational attainment SATS

Safeguarding		
Component	Action/output	Measures
Prevention	Access to Family Nurse Partnership Programme	No. in receipt % uptake
Primary care referrals	No. referred % all referrals to Soc. Serv.	
	Emergency department referrals	No. referred % all referrals to Soc. Serv.
Assessment	Timely access	% seen <48hours % reports available in 5/7
Interventions	CSA perpetrators prosecuted Interventions available	No. + % prosecuted Specific intervention measures
	Repeated abuse	% children reabused
Long-term support	Family support	% LAC

Head injury RTA		
Component	Action/output	Measures
Prevention	20 mph speed limit in residential areas Cycle helmet use	No of RTA in res. Area Miles of 20mph limit % cyclists in ED without helmets
Identification	Time to ambulance arrival	Av. Time to arrival at scene
Assessment	APLS in ED	% staff trained
Interventions	Access to CT scan	Av time to CT.
Long-term support	Access to neurorehabilitation	% receiving

ADHD		
Component	Action/output	Measures
Prevention	Parenting behaviour support	No of parents accessing BS programmes
Identification	SENCO trained in ADHD	% SENCOs trained
Assessment	Use of standardised assessment tools	% referrals with standard assessment
Interventions	ADHD programmes Use of methylphenidate	% access to programmes % children on medication
	Review bundle	% achieved
Long-term support	Educational success	SATS achieved

Juvenile idiopathic arthritis (JIA) – chronic uveitis*		
Component	Action/output	Measures
Prevention		
Identification	Parental awareness through written information	% families given written information
	Ophthalmology screening in all JIA patients as per guidelines	% JIA patients screened
Assessment	Full ophthalmology	Yield from screening

	assessment in screened patients	
Interventions	Appropriate treatment of uveitis	% JIA patients with uveitis on appropriate treatment % patients suffering visual loss
Long term support	Visual loss	Access to visual aids and specialist ophthalmology support

Rheumatoid arthritis – cardiovascular complications*		
<i>Component</i>	<i>Action/output</i>	<i>Measures</i>
Prevention	Normalising disease activity	% patients with normal disease activity scores
	Healthy lifestyle and exercise programmes	% access
Identification	Surveillance for cardiovascular risk factors and cardiac symptoms	% patients assessed for standard cardiovascular risk factors and cardiac symptoms
Assessment	History, examination, ECG and Chest XR Additional tests as indicated eg exercise testing, echocardiogram	% patients appropriately investigated (bundles of care approach)
Interventions	As clinically appropriate: <ul style="list-style-type: none"> • Medical treatment • Intervention eg stenting • Surgery 	% patients being appropriately treated
Long term support	Cardiac rehabilitation	% access

*With thanks to Deborah Bax

Good measures

Good measures matter

Good measures matter to a wide group of stakeholders. They address the important issues. In the ideal world they are equally relevant to patients, clinicians and managers. They represent the output at key points along the pathway - without good performance at these key points, optimal outcomes are unlikely to be achieved.

- Prioritise where there is a high burden on society
- Start where there is known to be a problem and there is a willingness to change.
- Measures often help to clarify the purpose of the service.
- They address the most important issues in the pathway
- Understandable to a wide audience
- High priority (likely to attract resources)
- Inform decision making (the right info to the right people, at the right time)
- Amenable to intervention (evidence base available)
- Interventions that are available, practical and affordable

Good measures have meaning

Good measures have meaning. They are based on data which are accurate, practical, they are scientifically valid

- clear case definitions
- clear population denominators
- clear measures of the environment (where adjustment is necessary eg for deprivation)
- there are reliable data collection and coding systems
- there is reliable data transfer, analysis and storage
- clear lines of accountability of who is responsible for what and by when
- identified person responsible for analysis, interpretation and dissemination of data
- there is a regular feedback, in a meaningful form, to the people who are interested and have responsibility for improving the system
- there is quality control throughout the system and mechanisms for the follow up of issues/or problems identified in the data collection/analysis/dissemination system.

Good measures motivate

Good measures motivate people to reflect on their meaning, often ask more questions, and where performance is poor then they drive the process of further analysis and improvement.

- they are comparable, for example between individuals, services, departments or networks.
- they may need adjustment to allow for case mix or different populations.

- improvement must be possible and indeed achievable
- changes in the original measure are able to detect improvement.

Good measures monitor

Measures should also monitor improvement

Be sensitive to change

Narrow confidence intervals (volume dependent, process v. outcome)

Good information systems

The translation of data into information and information into knowledge requires good information systems which should be:

- simple in terms of structure and operation
- flexible i.e. able to be changed in the light of experience
- acceptable both in terms of input and output with regard to
 - patients
 - staff collecting of data
 - agency hosting the system
 - health commissioners
- representative over time, populations and places
- valid
- comparable/compatible with other systems
- complete (high levels of reporting)
- sensitive (able to detect changes)
- accessible (to ad hoc enquiries)
- cost effective/useful i.e. contributing to the understanding and management of the problem
- have low levels of bias
- be timely

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Post Darzi measures exercise

- Divide into like-interested small groups.
- Check you all understand the principles.
- Decide on one significant pathway.
- Identify major components.
- Identify actions/outputs.
- Think about the best measures.
- Complete the form.
- Prepare to present/justify your choices.

Pathway title:		
<i>Component</i>	<i>Action/output</i>	<i>Measures</i>
Prevention		
Identification		
Assessment		
Interventions		
Long-term support		

Comments?

Pathway title:		
<i>Component</i>	<i>Action/output</i>	<i>Measures</i>
Prevention		
Identification		
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Long-term support		

Comments?