

INTEGRATING CARE FOR CHILDREN WITH ALLERGIC DISEASES: THE UNITED KINGDOM EXPERIENCE

John O Warner^{1,2,3} | OBE, MD, FRCP, FRCPCH, FMedSci

Sophie JIM Spitters³ | MSc

1. Professor of Paediatrics Imperial College London

2. Honourable Professor University of Cape Town

3. Imperial College London, NIHR CLAHRC Northwest London

THE KNOWLEDGE–PRACTICE GAP

The increases in knowledge of basic mechanisms and identification of new modalities of treatment for allergic diseases are bewilderingly rapid. Allergy practice has changed in the past 30 years from a discipline often pejoratively considered to be akin to witch-doctory into a highly scientifically based speciality. We have moved from identifying triggers by skin testing, allergen avoidance and allergen immunotherapy, to component-resolved diagnostics, tolerance induction and the use of an increasing array of targeted mono-clonals and small molecules.¹ This trend will continue with a focus on an individual's responses to allergenic epitopes and subsequently treatment with personalised peptide therapeutics enhanced with immune-modulating mono-clonals and/or small molecules. Ultimately, it may be possible to switch off allergic responses via a bone-marrow transplant of an allergen-moderated antigen-presenting cell.²

We now know that socio-economic, ethnic and geographical variations have a significant impact on the prevalence of allergic diseases. The environment through epigenetic and meta-genomic mechanisms is changing susceptibilities. This likely explains the huge increases in allergy prevalence initially affecting the relatively affluent settings of the Western world but now occurring in Third World countries that are experiencing mass migration from rural to urban settings. As it is clear that most allergic diseases have their origins in early life, there will also be an array of public-health-delivered strategies which will focus on primary prevention in pregnancy and the first year of life.³ In addition, early intervention after allergic sensitisation is detected – but before manifestations of disease – is already a priority to reduce the health–economic burden.⁴ Health professionals will need to keep pace with these developments.

The gap between the generation of new knowledge and its application in clinical practice is significant.^{5,6} The UK Research Evaluation Framework (REF), a component of which requires university medical faculties to present case

examples of the impact of their research, provided the opportunity to estimate the so-called 'knowledge–practice' gap. The mean time to the adoption of new knowledge was 15 years. Factors that have been reported to be major contributors to this knowledge–practice gap are especially relevant to allergy. They include the rapid advancement of medical knowledge such as:

- the described increase in knowledge of allergy mechanisms and new approaches to management;
- changing healthcare needs due to the increased prevalence of chronic conditions, such as allergic conditions, that require coordinated management, and
- cumbersome healthcare processes that slow down care and result in information loss between health professionals.⁵

In addition, there is a long delay before undergraduate (U/G) and postgraduate (P/G) education addresses the changing patterns of healthcare requirements and new knowledge and an innate resistance to change at all levels – both individual and institutional – in health services which require new ways to overcome barriers.⁷ There is also a confused community understanding of the causes and consequences of allergy fuelled by a rapacious media only too happy to sensationalise sometimes unproven claims. Inevitably, this results in poor outcomes from medical care and patient dissatisfaction with conventional allergy practice leading to a frequent resort to complementary and alternative medicine (CAM).⁸

The dramatic influence of early life as the principle period of susceptibility to environmental influences affecting the development of allergic disease is most apparent in communities migrating from developing world countries with a low prevalence of allergy to more affluent countries with high rates of allergic disease. Therefore families moving from mainland China to Hong Kong or Canada, and Asian families moving to the United Kingdom retain a low rate of allergic disease if they migrated as adults, while the highest rates occur in the next generation born in the Western environment.^{9,10} As the parents have not been exposed to allergies and are not familiar with their

manifestations, they often do not recognise their child's problems as potentially allergic, leading to major delays in gaining appropriate medical care.

In the United Kingdom access to specialist services has been described as a 'post-code lottery' and patient-reported experience is depressingly poor. The lack of U/G and P/G training in allergy has resulted in poor management at a primary care and district general hospital (DGH) level. Too few specialist services are distributed patchily around the country. These issues have been extensively reviewed and published in successive reports by the Royal College of Physicians (RCP) and government committees. In 2003 the RCP published 'Allergy; the unmet need',¹¹ and in 2010 'Allergy; still not meeting the unmet need'.¹² There have been substantial reports from the Parliamentary Health Committee, the Department of Health (DH) and the House of Lords Science and Technology Committee.^{13–15} The professional response has been to generate management guidelines at regional, national and international levels, mostly in large indigestible documents rarely read in detail by those delivering care. Evidence suggests that guidelines have not improved management or outcomes. This is, for instance, evident from successive reviews of asthma deaths over the past 50 years of which the findings were repeated and complemented in the 2014 UK National Review of Asthma Deaths, the largest study of its kind to date. Each review identified that the majority of deaths were potentially avoidable with identical factors contributing to fatal outcomes. The over-riding causes were failure to follow well-established management guidelines and adverse psycho-social circumstances.¹⁶

What is abundantly clear is that there is an urgent need to develop integrated care programmes linking all agencies involved which must include health and social services, education and employment settings. Medical professionals need improved education, training, support and experiential learning with regular continuing professional development (CPD) updates.

KEY DRIVERS

Patients and their representative organisations are gaining influence politically and will increasingly do so in the future.¹⁷ The medical profession will ignore this at its peril. Failure to respond appropriately to the increase in public access to electronic information will fuel dissatisfaction. Poor patient experience is linked to poor outcomes, yet it is given scant attention.¹⁸ Where an integrated approach involving patients is employed outcomes improve significantly.¹⁹ However, the currently employed Patient Reported Experience Measures (PREMs) are too crude to guide disease-specific efficacious change. PREMs are used in UK medical services as Red/Amber/Green benchmarking comparisons of processes in trafficking patients through a service and not issues fundamental to specific conditions. It is true that patient–public involvement (PPI)

can be challenging in a system of data overload with professional and organisational boundaries that do not exist in patients' experienced realities.²⁰ However, to achieve its benefits PPI must be more than a token exercise which is all too frequently the case at present.²¹ PPI will become a major driver for allocation of resources to support service change and indeed also research funding.

Health economics is having an ever greater impact as it is perceived that the demand far exceeds the capacity to deliver in current health systems.²² Development of new modalities of treatment is expensive and the pharmaceutical industry will need to ensure that the investment costs are off-set not only by sales but also provide profits for shareholders and resource to invest in continued research and development (R&D). However, in our opinion, the health–economic view that we cannot meet the demand with current resources is over emphasised. The high costs are a consequence of working in systems that have evolved over centuries and are changed only in response to short-term political imperatives rather than long-term planning. The current diversity of providers militates against coordination of service delivery but the barriers are not insurmountable. Hitherto, too little has been focused on integrating care across institutional boundaries. Finland provides the best example of a successful whole-country integrated approach to the management of asthma and related atopic diseases. The savings to the country's economy have been huge and include not only reduced direct healthcare costs but also indirect costs such as those related to loss due to missed education and work-day absences.²³

Expertise exists at many levels and particularly harnessing community action to facilitate health promotion and handling of minor illnesses would reduce the economic burden considerably. This is iterated in great detail in the UK Kennedy report 2010: 'Getting it right for children and young people – overcoming cultural barriers in the National Health Service so as to meet their needs.' The emphasis in the report is on efficient service provision with local partnerships including all agencies involved in the care of children in a locality. The report summarises the recommendations with a concise statement:

'What is needed is a common vision that is strong enough to bind all the agencies together while taking account of different perspectives ... The future must be one of a holistic approach to the child or young person.'²⁴

ALLERGY-CARE PATHWAYS

One of the few positive outcomes of the successive reviews of allergy services in the United Kingdom was that the Royal College of Paediatrics and Child Health (RCPCH) was commissioned by DH to map allergy-care pathways for children.²⁵ Care pathways are tools for planning and organising care processes, aiming to improve the

patient journey or as the European Pathway Association (E-P-A) states: 'A methodology for the mutual decision making and organisation of care for a well-defined group of patients during a well-defined period.' (p 57).²⁶ The pathway development, a two-year project, proved to be highly successful predominantly because a wide range of stakeholders was involved. Eight national-level pathways were formulated using published evidence where available and otherwise patient–professional opinion. All have been published and the report is accessible on the RCPCH web-site: <http://www.rcpch.ac.uk/allergy>. The pathways are based on competence to deliver gold standard care rather than dictating the setting in which this should occur. Each step in the pathway is attached to a competence framework and the best evidence-based guidelines for specifics of management. By focusing on competence rather than setting, the aim was to create flexibility whereby care could be moved progressively away from high-cost specialist services into the community and ultimately the patient's home. This flexible design also supports the implementation of the national-level care pathways locally, providing the ability to make them fit with existing care structures and available resources.²⁷ However, DH subsequently refused to endorse the outputs. A sound-bite from Eddie Cochrane's *Summertime Blues* comes to mind as an explanation:

'I called my congressman and he said, quote.
I'd like to help you son but you're too young to vote.'

Thankfully a funding source appeared which provided the opportunity to implement the pathways.

QUALITY IMPROVEMENT AND CARE-PATHWAY IMPLEMENTATION

Improvement science has emerged as a strategy to understand and narrow the knowledge–practice gap in healthcare.²⁸ It is driven by the perspective that most evidence-based care recommendations, originating from highly controlled and additionally resourced studies, do

not magically translate into improvements in real-world healthcare settings, which are complex social systems. A successful translation requires a deep understanding of the local setting, the local needs for improvement and the local priorities. It also requires 'how-to knowledge', for example, how to put supporting processes in place and how to coordinate behaviour change of the professionals involved.²⁸ Qualitative research, which is still viewed by many clinical academics as non-scientific, is essential in order to study real-world change.

The National Institute for Health Research (NIHR) in the United Kingdom has become a major funder of medical research. Over the past nine years it has run a programme known by the tongue-twisting title of 'Collaboration for Leadership in Applied Health Research and Care' (CLAHRC). CLAHRCs were set up with the purpose of establishing mutually beneficial local partnerships between universities and National Health Services (NHS) organisations focused on closing the knowledge–practice gap and improving patient outcomes through the conduct and application of applied health research.²⁹ Each CLAHRC is to some extent organised and structured differently.³⁰ One of the aims specifically linked to the Northwest London CLAHRC is to implement and test their systematic approach to quality improvement (QI), which consists of several evidence-based QI methods (see Table I).³¹

CLAHRC Northwest London delivered the financial resource and facilitated the use of their QI approach to support the implementation of the RCPCH paediatric allergy-integrated care pathways locally in three Northwest London areas. This project became known as 'Itchy Sneezing Wheezy' (ISW). The key to success in implementing change in diverse settings each with different agendas required the employment of QI methods. These required the engagement of a wide range of relevant stakeholders including but not limited to: patients and their representatives, doctors, nurses, commissioners and data analysts. Having the right people in the room and employing

TABLE I: NIHR CLAHRC FOR NORTHWEST LONDON COLLABORATIVE METHODS (ADAPTED FROM HOWE ET AL 2013)

QI methods and key related references	Purpose of using the method
Process mapping ^{32,33}	To reveal the current working practices for all those affected by the multidisciplinary care or data processes. To support process design.
NHS III Sustainability Model ^{33,34}	To identify and collectively address the factors that may affect long-term success.
Action-Effect-Method (based on driver diagrams) ³⁵	To clarify and agree the aim and scope of the work and identify the ideas for action (intervention) in the context of their anticipated effects. See Figure 1 for an example.
Model for Improvement including Plan-Do-Study-Act (PDSA) rapid cycle testing of change ideas ³⁶	To establish and agree what is intended to be accomplished, how to demonstrate that the change is an improvement and to generate ideas for what those changes might be. To undertake systematic rapid iterative cycles of change.
Measurement for improvement ^{37–39}	To determine operational definitions of process and outcome measures to ensure that these are consistently used and understood within the work, with routine weekly use of the data to inform the project implementation.
Stakeholder engagement ^{40–41}	To identify and engage effectively with all key stakeholders and groups.
Patient and public involvement ^{42,43}	To engage with patients and the public to ensure the voice of the customer is clear in the work.
Dissemination of learning ⁴¹	To share and disseminate the experience and learning generated in the project internally and externally including through peer-reviewed journals.

the QI methods facilitated merging of scientific evidence and local knowledge; creating shared understandings of local problems, needs and actions; and very important, they generated enthusiasm and commitment from diverse initially very sceptical participants. This process has generated an expanding cadre of clinicians, patients and community champions with knowledge and expertise in QI.

The application of validated and evidenced-based QI methods will become an established component for narrowing the knowledge–practice gap to achieve better outcomes from healthcare delivery. Qualitative research is still viewed by many clinical academics as non-scientific and therefore, is often inappropriately under-represented. It can provide important insights to indicate the need for change and generate hypotheses which can then be investigated and substantiated quantitatively.

THE ITCHY SNEEZY WHEEZY PROJECT

The implementation of allergy-care pathways for children in the ISW project commenced in three health districts around the tertiary paediatric allergy service based at St Mary's hospital in inner Northwest London. Using the QI tools outlined above, the project developed a series of

interventions over a period of 18 months. These included:

1. A multi-disciplinary training programme for all health professionals including seminars and hands-on learning.
2. Community-based allergy clinics conducted mostly in general practice (GP) surgeries alongside GPs, therefore providing experiential learning. This was initially delivered by specialist hospital-based paediatric allergists with an allergy nurse specialist and a community dietician. However, as the nurse gained expertise the consultants progressively took a 'back seat' providing support and supervision.
3. A web-site with sections for health professionals and patients or their parents/cares: www.itchysneezywheezy.co.uk. This included video clips explaining the procedures likely to occur during clinics, guidance on the use of medications such as inhalers for rhinitis and asthma, and skin care for eczema.
4. A paediatric allergy-specific PREM was developed and validated within the St Mary's specialist service. This provided further evidence of the shortcomings of holistic care delivery. Whereas there was a high level of satisfaction (99%) with the tertiary service, it highlighted the frustration with delays in getting a

The Itchy Sneezy Wheezy Project

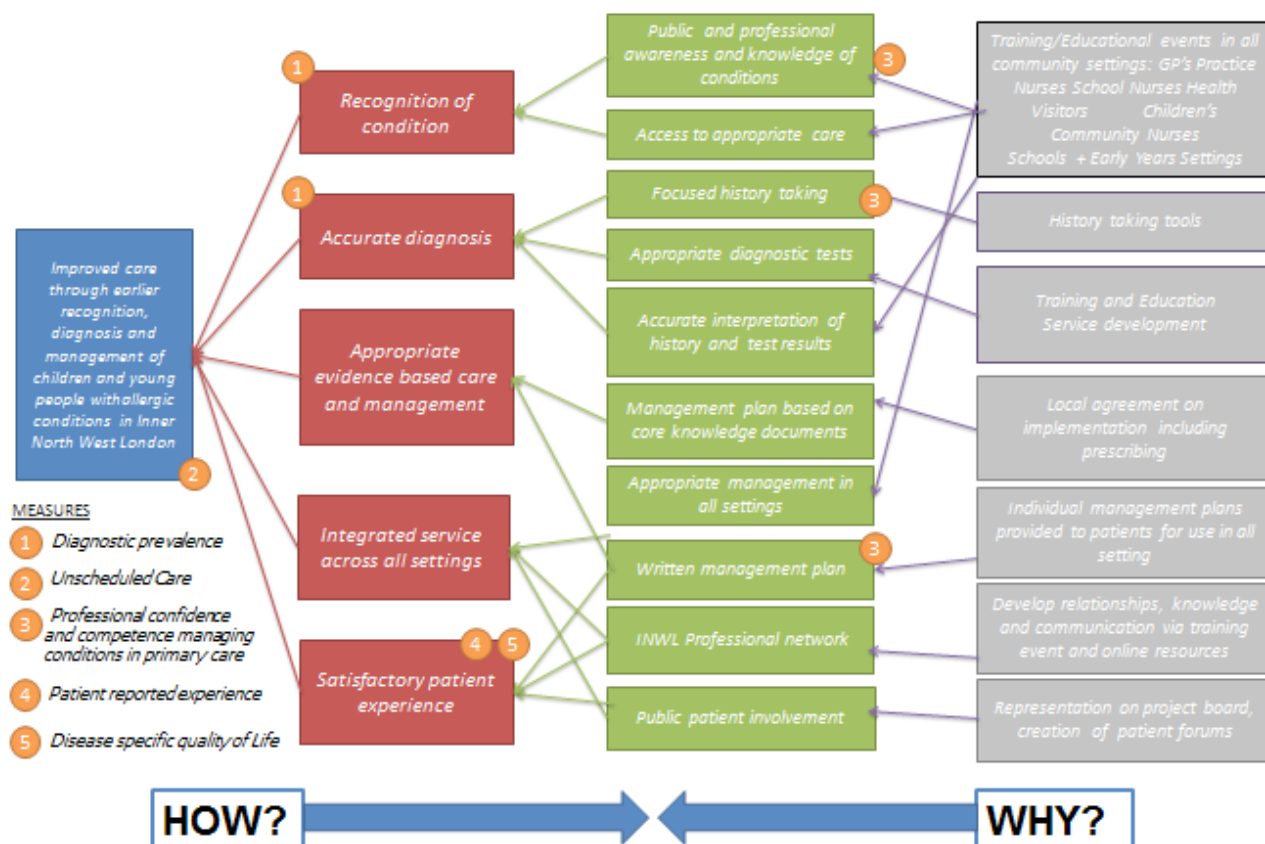


Figure 1: An example of the action effect diagram developed during stakeholder meetings to formulate the strategy to improve service delivery for children with allergic disease(s)

referral and consequent appropriate diagnosis and treatment. Furthermore, parents perceived that there was poor communication from the specialist service to GPs and schools in 27% and 48% respectively.⁴⁴ The PREM responses have guided the implementation strategies and it is now being used to monitor outcomes from ISW.

The outcomes from the project provided the evidence to build a business case to sustain ISW. These included:

1. A significant reduction in unscheduled admissions to hospital and recidivist accident and emergency (A&E) attenders for acute exacerbations of allergic diseases.
2. Reduced costs in delivering out-patient care in the community rather than hospital.
3. Improved PREM responses with a higher rate for providing written action plans and achieving high patient–carer satisfaction.
4. Improved primary-care confidence and competence in managing allergic children. This was particularly evidenced by significant improvements in the quality of GP referral letters.
5. A favourable health–economic evaluation which if applied throughout England would have saved £10 million in the first year.

However, it is important to also review the problems that have been overcome only in part. There remains a siege mentality in a financially stressed health service. This is fuelled by the suspicion that by changing the pattern of delivery of care, income will be lost and this leads to inevitable competition between an increasing diversity of providers and an innate resistance to change. The conflicting health-provider agendas create impediments to cross-boundary collaboration and finally families frequently try to bypass the system and demand direct access to hospital services. All the above are being slowly addressed as evidence of the effectiveness of the intervention becomes apparent. However, attempts to reduce costs by implementing only a continuation of part of the programme in inner Northwest London has resulted in a loss of some of the benefits and an increase in referrals to the already stretched tertiary service.

Notwithstanding the problems, the implementation programme is now running in four health districts in outer Northwest London and in several other regions in England. For each, the QI process (including some or all of the QI methods in Table I) has been repeated and has resulted in different strategies towards integrating allergy care and implementing the pathways. There is no 'one-size-fits-all' and context must be taken into account. For example, in one district the team decided to focus in the first instance on asthma alone as they already had a good paediatric respiratory service and local perspectives were that this was the priority. However, after one year its success has led to the approval for funding a broader

allergy-based programme for future years. Another district was unable to establish community clinics in primary-care settings and elected to run them from their DGH. They focused on an efficient follow-up of A&E attenders and on reducing emergency admissions. This achieved the cost–quality improvement commitment which the hospital had undertaken as part of a national initiative.

CONCLUSIONS

The prevalence of allergic diseases has increased to almost epidemic proportions in the past 50 years⁴⁵ and is posing an ever-increasing health–economic burden on communities worldwide.^{46,47} Service provision has lagged behind the need and, in addition, there is a large knowledge–practice gap. Whereas evidence-based guidelines are available for most allergic conditions, their application in practice is lacking. Addressing this translational gap requires a change in mindset, focusing not only on what models of care or what interventions to implement, but also on how to overcome the barriers to implementation of integrated care locally. Employing well-established QI methodologies can achieve considerable benefits in the delivery of holistic care. This will lead to better patient experience, health outcomes and reduced costs to health services.

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