

THE MEDICAL ROYAL COLLEGES AND THE CONCENTRATION OF HOSPITAL SERVICES: A PROPOSED RESEARCH AGENDA

Diane Dawson and Robin Dowie

Centre for Health Economics, University of York, and Health Economics Research Group, Brunel University

ABSTRACT

In 1996, faced with what appeared to be continuous pressure for further concentration of hospital services, the NHS Executive commissioned a systematic review of available evidence on the possible effects of concentration on hospital costs, clinical outcomes and patient access. A clear driver for increased concentration of services appeared to be the influence of the medical Royal Colleges on the supply of labour to the hospital sector.

The relevant Royal College guidance can be divided into three groups reflecting both the legal status of the guidance and the directness with which it is likely to impact on concentration:

- Teaching and training requirements
- Guidance on staffing levels and workloads
- Treatment guidelines

In a review of guidance that has been issued during the past ten years it was clear that rarely was the impact on NHS services taken into account when guidance was issued.

This paper considers how we might develop a methodology for identifying the likely impact on concentration of NHS services of guidance issued by a medical Royal College. It sets out for discussion the possibility of using patient pathways to organise the relevant information and identify key questions. It suggests that Health Economics might borrow from Environmental Economics the idea of an "Environmental Impact Statement" that would accompany each major piece of Royal College guidance, identifying important impacts on patient care and highlighting "externalities", consequences for other specialities and units of the reconfiguration recommended in the guidance.

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I. Introduction

In 1996, faced with what appeared to be continuous pressure for further concentration of hospital services, the NHS Executive commissioned a systematic review of available evidence on the possible effects of concentration on hospital costs, clinical outcomes and patient access.¹ The evidence cast doubt on there being any cost advantages of hospitals with more than 600 beds and the evidence that clinical outcomes improved as hospital size increased was patchy or non-existent. A key driver for increased concentration of services appeared to be the influence of the medical Royal Colleges on the supply of labour to the hospital sector.²

Royal College initiatives are clearly not the sole influences on the labour market that are forcing change in the way hospital services are delivered. In the UK the main factors can be categorised as:

- 1) The general state of the labour market
 - relative wages
 - alternative employment opportunities
- 2) Government policy
 - supply of medical school places
 - junior doctor hours
 - immigration control
- 3) European Union policy
 - medical education and training directive
 - working hours directive
 - free movement of professional labour
- 4) Royal College guidelines
 - accreditation for teaching and medical education
 - staffing recommendations
 - treatment guidelines.

It is not immediately evident that events noted in 1-3 should have an impact on *concentration* – e.g. substitution of consultants for junior doctors does not require concentrating consultants in larger units and closing smaller facilities. As argued below, the activities noted under (4), recommendations of the Royal Colleges, are those most likely to affect concentration and will be the focus of the remainder of this paper.

Why should we be concerned with the effects of changes in service delivery on the concentration of services? The traditional reason for economists to be interested in concentration was the effect on market power: increased concentration was expected to enhance the market power of providers at the expense of purchasers. X-inefficiency was expected to be higher and the responsiveness of providers to purchasers reduced. In the “New” NHS we are not supposed to be concerned with this issue as the increased powers of the Executive and Health Authorities to influence Trusts are intended to reduce the adverse effects of local monopoly. It remains to be seen if the new powers are effective constraints. If increased concentration reduces contestability, the expected innovations from PCG commissioning may be sensitive to the degree of provider concentration.

A second reason why the impact of service reconfiguration on concentration deserves attention was highlighted in the CRD report: there may be important diseconomies of scale in hospital services. It is not clear why this is the case. The traditional explanation found in the economics literature was that limitations on management, and information problems cause costs to rise in large firms. In considering hospitals as firms it is possible that concentrating physicians in one unit rather than two or more permits them to change the way they practice medicine in a way that indirectly raises unit costs—e.g. more sub-specialisation is possible and that alters the kind of treatment provided and the resource implications. Large units use different production processes from those of smaller units. Whatever the reasons for cost differences, where increased concentration is likely to affect the cost of services, it is important that this effect be taken into account when evaluating proposals for reconfiguration.

The final reason why we should be concerned with concentration was also highlighted by the original CRD report: we are concerned with the effects on equity of access of increasing concentration of services. The 1996 report found there was little evidence available on this issue. As pressures for concentration increase, it is important we find ways of identifying possible effects on access at a point when proposals for service reconfiguration are being considered rather than after they have taken place.

It is becoming accepted that there should be an “evidence base” for clinical practice. The CRD report on Concentration and Choice reflected the view that this principle is equally relevant to proposals for change in the organisation and delivery of services. In reviewing the evidence supporting guidance issued by the Royal Colleges, two problems in particular were noted. First, in the vast majority of cases, there was little or no evidence cited in support of the proposals for change. Second, it was unclear exactly what kind of evidence was relevant, and should be produced, to inform Royal College recommendations for change in the organisation of services. In this paper we are primarily concerned with this last issue. Section II considers what kind of evidence is relevant to the various types of Royal College guidance. Section III looks at a possible approach to the production of evidence relevant to decisions on service configuration, and Section IV offers a strategic approach for considering externalities generated by implementation of Royal College guidance.

II. What Kind of Evidence?

i) *Treatment guidelines*

The evidence ordinarily considered relevant to assessment of a new intervention or therapy is evidence on clinical outcomes—what is the effect on the health states of patients? When a Royal College produces **treatment** guidelines, there is no doubt that the relevant evidence should include evidence on patient outcomes. At least one Royal College has moved to the production of “evidence based” guidelines and grades the evidence on outcomes along the lines set out by the NHS Executive:

- A - based on randomised controlled trials
- B - based on other robust experimental or observational studies
- C - based on expert opinion and respected authorities.

Historically absent from treatment guidelines has been information on the cost of implementing the guideline or on the changes in cost and access consequent on any service reconfiguration.

It could be argued that the Royal Colleges should not be concerned with issues of cost and access. Their job is to identify and promote “best practice”, to set out in a guideline the “ideal” service. It would then be up to the Department of Health to identify the implications for cost and access and to decide whether a particular guideline should or should not be accepted for use in the NHS. The problem is that the relationship between the Department of Health and Royal Colleges is not arms-length. Often the Department finances and co-operates with representatives of the Colleges in the development of guidelines. Once produced, it is politically very difficult for the Department to say the recommended “best practice” has been judged unacceptable for the NHS.

A requirement that guidelines developed by the Royal Colleges with funding from the NHSE incorporate consideration of cost has now been in place for two years¹⁵ but there is no agreed methodology for generating the cost information or for incorporating it with the evidence on outcomes in a way that will shed light on cost effectiveness. Even though treatment guidelines must now include some consideration of cost, traditional approaches to costing treatment tend to take costs as independent of scale or of the configuration of services—so many minutes of a consultant’s time, the current cost of a test from a lab working at current capacity. There is no attempt to consider whether adoption of the treatment protocol, by altering the scale of activity and use of joint inputs, will change the cited direct costs or alter other system costs.⁴

ii) *Staffing recommendations*

Royal College recommendations on staffing and workloads only rarely attempt to relate the prescribed pattern of staffing to patient outcomes. Traditionally, surveys of workloads, international and domestic, would be used to support recommendations for the number of doctors per thousand admissions or the number of consultants per thousand population. A relatively recent exception has been recommendations for the number of sub-specialists. Evidence on patient outcomes for a particular procedure will be put forward as supporting a move from treatment by a generalist to treatment by a sub-specialist, vascular surgery and emergency management of aneurysms and ischaemic legs³ being a good example. Evidence that treatment by a sub-specialist might be superior is then combined with a recommendation on minimum workloads assumed necessary to maintain skills (which may not be supported by evidence). This transforms evidence that one or two procedures may show superior clinical outcomes when carried out by a sub-specialist into a recommendation for increased concentration of services provided by the speciality as a whole.⁵ We are then told that, given this particular speciality should become concentrated (call it general surgery), other specialities on which it depends should also be concentrated. If, to ensure adequate workloads for sub-specialists in general surgery, general surgery must be concentrated in larger hospitals with larger catchment areas, then, of course, anaesthesia must be concentrated and if that occurs, obstetrics (which depends on anaesthesia) must be concentrated, and so forth. At no point in this chain of reasoning is there any evidence that **patient outcomes** in obstetrics will improve or deteriorate as a consequence of the service reconfiguration generated by evidence on a few surgical procedures.

If Royal College recommendations on staffing were subject to the same criteria as the clinical guidelines, we would want: (1) evidence on the expected **change** in patient outcomes if the recommendation is implemented (it would not be sufficient to simply say outcomes are expected to be better); (2) evidence for the expected change in costs; (3) where there are significant implications for other specialities, a review of any available evidence on likely changes in these patient outcomes and costs.

iii) *Accreditation for training and education*

Given the high dependence of UK hospitals on junior doctors to provide routine patient treatment, the pattern of staffing the Colleges require for hospital accreditation in effect dictates service configuration. (Neither the surgical Royal Colleges nor the Royal College of Physicians will approve accident & emergency posts for SHO training unless “the essential disciplines of general medicine, general surgery, trauma and Orthopaedics and anaesthetics are represented by on-site residents”.⁶) Royal College recommendations on training and education, that underpin decisions on accreditation, are no more likely than the staffing recommendations above to be based on evidence of effect on patient outcomes. Medical education is an investment in human capital with a payoff expected over the next thirty to forty years. The curricula reflect the judgement of senior members of the profession as to how students should be trained in the present to treat patients in the future. What is rarely mentioned in documents setting out a College’s policy on training and hence on accreditation is the effect adoption of their proposals may have on **existing** patients. A classic example is the May 1996 report issued by the College of Paediatrics and Child Health on Future Configuration of Paediatric Services. A key recommendation was that small units closer than 30 minutes by road from an adjacent paediatric unit should amalgamate onto a single site for 24-hour inpatient facilities.⁷ The grounds were that larger units (ie with 1800 or more paediatric medical admissions per year) were superior for the purpose of training in paediatrics. There was no mention that this would leave numerous maternity units without paediatric cover and might require a reorganisation of maternity services in ways that could undermine existing NHSE policy on maternity services which “need to be appropriate, acceptable and accessible to the local population”.⁸

Royal College requirements for accreditation for training must be met by Trusts or the Trusts lose access to a major part of the clinical labour force. Clinical guidelines and staffing recommendations can be ignored but not staffing, specialisation and throughput requirements for training. What evidence, if any, should be presented in support of changes in service configurations intended to benefit training? The most basic requirements would be those noted above under (ii) on staffing. It is probably impossible to generate relevant evidence on the question of how a change in training

to day will affect patient outcomes in the future. However, it is possible to ask how the reconfiguration required for training to day is likely to affect patient outcomes today and costs today. It is possible and important to ask for information to be presented on where the changes in services required to meet new training requirements for a particular speciality are likely to have significant impacts on patient care and cost of other specialities or other parts of the NHS.

iv) *The current position*

In economics the most important information relates to the margin, what is likely to change and in what direction. It appears that genuine progress is being made in acceptance of minimum standards for relevant evidence for clinical guidelines when the guidelines are viewed in isolation. Why has there been so little progress in recognising the importance of, and developing a methodology for, generation of evidence relevant for the other two major types of Royal College guidance—recommendations on staffing and requirements for accreditation? There are (at least) two obvious reasons why critical information needed to assess such Royal College guidance is usually missing from the documentation accompanying the guidance.

First, as health care delivery is such a highly integrated system the information requirements appear overwhelming. We would need a sophisticated input output model to be able to track the effects of guidance that, say, concentrates consultants in paediatrics in large acute units. If access affects demand, the workload of GPs would change and outcomes would need to be assessed for children no longer treated by hospital based clinicians as well as for children treated in the new units. If obstetrics followed paediatrics, there would be changes in clinical outcome for women undergoing childbirth. All points in the system would experience changes in demand, cost and possibly patterns of use that raise issues of equity. We don't know enough about the system to model it, we cannot generate all the relevant information, there is no point asking for the impossible. Science is the "art of the solvable".

The debate over how to proceed in economics, when our information is limited and models are incomplete, is an old one. Given our present interests, a particularly relevant version of the debate took place in the mid-1960s as economists debated how

to formulate “second-best” solutions to policy problems when the theory clearly showed the second-best solution for one activity depended on knowledge of cost and demand conditions in every other part of the economy. The consensus that emerged was well reflected in the title of a paper by Davis and Whinston, “Piecemeal Policy in the Theory of the Second Best”.⁹ We should focus on what we expect to be the strongest links—if the policy problem is how to price activity A, look at the effects on activity in the sectors thought to have the highest cross-elasticities of demand and supply with activity A. It won’t be exactly the right answer (a general equilibrium solution is not available), but it will be an improvement on a policy based on ignoring all other sectors and only looking at activity A in isolation.

A second reason why critical information is usually missing on how a piece of Royal College guidance may affect patient outcomes, cost and access is that there are important externalities in the organisation of health care. The bodies ordinarily mandated to develop a particular piece of guidance are responsible to the members of their speciality or College. When the Royal College of Surgeons develops what they consider to be an “ideal” pattern of staffing and training for surgical sub-specialities, it is not their job to consider the consequences for provision of obstetrics or general medicine if surgical facilities are reorganised in line with their recommendations. When Royal College of Surgeons’ recommendations are translated into requirements for accreditation, the unintended consequences for costs and patient treatment in other specialities are borne by the NHS, not by the body producing the original proposal. This is not an unusual problem in applied economics and in recent decades considerable progress has been made in finding techniques for bringing information on externalities to bear on proposals for changes in a variety of economic activities.

III. A First Step

If over time we are to acquire information that will be useful in gaining understanding of this complex system, we need to start somewhere and accept that the initial results may be crude. The key issue is whether the approach is conceptually sound and experience gained using it can be expected over time to lead to improvement in the quality of information generated.

We would suggest development of a straightforward set of questions that would routinely be asked of proposals contained in any guidance likely to affect the configuration of services. (This includes guidance prepared in future under the auspices of NICE.) We propose to start with potentially the simplest case, a treatment guideline, and take as our example a guideline on the initial investigation and management of the infertile couple recently published by the Royal College of Obstetricians and Gynaecologists.¹⁰ This guideline forms part of a set on infertility care provided in the primary, secondary and tertiary care sectors, and they were developed by the College with funding from the clinical effectiveness programme of the NHSE. Figure 1 shows the algorithm which accompanies the guideline on initial investigation and management.

Implementation of a treatment guideline can be expected to affect concentration of resources in the NHS if:

1. It results in a change in the use of more specialised staff or “teams”;
2. It results in a change in the location of activity (e.g. from secondary to primary care);
3. It changes the probability that patients will present and therefore affects the scale of provision required at any point in the system.

Implementation will affect cost to the extent that (1) and (2) result in higher/lower cost per patient treated and (3) indicates a change in the likely number of patients treated. Implementation will affect equity of access as usually defined if the changed patterns found in (2) and (3) have a geographical or social class bias.

Ideally some form of modelling would be required in order to pick up the system wide effects of implementing change in one part of a highly integrated delivery system. However, given our lack of information, modelling can be a resource intensive exercise and it may be useful as a first step to construct a ‘decision (event) framework’ which identifies the main points at which a particular guideline indicates decisions or paths that affect the type of clinical resource to be used (eg special equipment, clinical expertise (GP, consultant in a sub-speciality)) and/or the location

of treatment (home, surgery, regional centre) and/or the probability that the number of patients presenting/treated will change. We would want to know the evidence for any expected change in the numbers likely to be treated but in the absence of evidence we may have to rely on the usual fall back of guideline construction, professional opinion. It is usually the case that existing clinical practice varies, so presenting information on change in the location and use of resources may require identifying ranges of likely outcomes (just as costing in multi-centre trials involves giving ranges of costs). The exercise of working through the framework, at each point asking the relevant numbers and resources questions, may enable us to identify the points likely to have the largest impact on concentration and access and hence the parts of the system on which it is most important to focus research resources.

To illustrate the approach, consider the framework in Figure 2. The framework is a decision-analytic representation of the algorithm in Figure 1 and it highlights recommended actions which cross the interface between primary care and secondary/tertiary care. The authors of the national infertility guideline anticipate that it will be used as the basis of local protocols which will take into account local service provision and the needs and preferences of the local population.

An iterative process would be required to answer our basic resources questions.

1. *Can the guideline be implemented with existing service manpower and facilities?*

At each point we (or local health commissioners) ask if implementing the guideline would change the location or clinicians currently seen by patients. If the answer is no, then the only likely effect on capacity is if implementing the guideline increases or decreases the number of patients likely to be seen. If there is to be a change in investigative or referral patterns, at each point where a change is indicated, we ask whether existing capacity is likely to be able to absorb the change in demand.

(Volumes of consultations per couple may increase in practices where GPs undertake repeated baseline investigations for infertile couples.) It is important to note that effects on capacity can be positive or negative—e.g. recommended use of specialist laboratories for tests rather than existing local facilities could mean a reduction in demand for local lab work that rendered the local facility uneconomic.

2. *What are the alternative ways of achieving the desired outcome?* If the guideline cannot be implemented without new capacity, we go through the framework again and at each apparent bottleneck ask if there is an alternative way of achieving the desired outcome. This should indicate the minimum increases in capacity needed to implement the guideline. As in the previous iteration, both positive and negative changes in capacity are noted—e.g. if specialist clinics are to be expanded and located in tertiary units and work is removed from secondary units where it had traditionally been undertaken, what will happen to the remaining gynaecological activity in the secondary units? What effects will the relocation of treatment have on access and utilisation?

3. *What other services may be affected?* The final iteration would work through the framework and at each point where a change in capacity or activity rates had been identified we would ask if there were good reasons to believe that any other NHS service would be affected by the change in the location and facilities for infertility treatment—e.g. would obstetrics or urology be expected to change the location or scale of activity?

These three steps should give us the basic material for a report on the resource implications of implementing the guideline and the nature of any “unintended” side-effects on other services or in the number or composition of patients presenting.

IV. A Medical Environmental Impact Statement

It has long been established practice in cost-benefit analysis and project appraisal that where important consequences (positive or negative) of a project cannot be directly incorporated into the formal appraisal, they should be identified and listed separately so that decision-makers can arrive at a judgement based on the overall impact of the project.¹¹ The most common examples of this problem arose with environmental impacts of roads, new factories, airports, out of town shopping etc. With increasing concern over environmental damage associated with economic development there was an interest in not only identifying and taking account of likely environmental damage

when deciding whether to permit a new development but also in providing incentives to minimise the damage that might be caused. The growth of environmental impact assessment and legal requirements for environmental impact statements to accompany proposals for development schemes, have attempted to deal with both information and incentives.¹² A proposed development cannot be given planning permission unless the proposal is accompanied by an assessment of the likely environmental impact of the scheme. The assessment must include description of the steps the developer will take to reduce the environmental damage the project may cause and the planning authority may send it back saying that even more must be done to reduce expected damage before the scheme will be accepted. Many early assessments were hit and miss, highly variable in quality and often slanted to conceal as much information as they conveyed. Over time as production of an environmental impact assessment has become more routine there are templates and guides to make it easier to identify relevant information and structure informative reports.¹³

Perhaps we should consider making it necessary to accompany guidelines on treatment, staffing or teaching with a “NHS” impact statement. The Royal Colleges are increasingly accepting the importance of including evidence on direct patient outcomes and direct costs in their clinical guidance. What is missing reflects failure to apply this approach to the other types of guidance they produce and failure to seek out the information needed for a policy assessment of whether the indirect effects on the system are acceptable or could be minimised. Given the well publicised disputes between the Royal College of Surgeons and the Royal College of Physicians over the desirability of reconfiguring NHS services into patterns of higher and higher concentration no one doubts this is an important issue and susceptible to economic analysis. The consultation document *Provision of Acute General Hospital Services*¹⁴ was a one off attempt to patch up the disagreements. However scientific and professional change is continuous and every year will see guidance produced that has important implications for service reconfiguration. As with environmental impact statements, we need a template, a basic approach and set of questions likely to be applicable to most guidance with implications for service reconfiguration. Such reports should be routine accompaniments of any guidance issued by a Royal College

V Discussion

We are looking for an approach that is manageable and likely to produce useful information on the system impact of Royal College guidance.

Given the complexity of this problem, a useful beginning would be to use a framework for asking questions and organising information that is already common in the health economics research community—a decision (event) framework similar to the decision models of treatment pathways for patients. Such a framework can be used to identify the key points in a piece of guidance where implementation would be likely to have a significant impact on service configuration. The framework could be used to do focused searches of existing evidence on outcomes and costs and to identify specific questions on which new research is needed.

The type of Royal College guidance that we ordinarily expect to be of most importance in its effect on service configuration is that on staffing and accreditation. However, while we are trying to develop the methodology, it may be useful to start with clinical guidelines—there is more evidence and the ramifications more limited.

What we would like to gain from an HESG discussion of the proposal in this paper is an indication of whether people see it as a reasonable way to begin, any suggestions for improving the approach or, if there are thought to be better ways of identifying the impact of guidance on service configuration, to set them out.

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- ¹ Ferguson, Posnett and Sheldon (1997) Concentration and Choice in the Provision of Hospital Services, CRD Report 8 NHS Centre for Reviews and Dissemination, University of York.
- ² Some of the material on the Royal Colleges, that did not appear in the published version of the CRD Report, can be found in Dowie and Gravelle (1997) "Changes in medical training and sub-specialisation: implications for service delivery" in Ferguson, Sheldon and Posnett, Concentration and Choice in Healthcare, The Royal Society of Medicine Press Ltd.
- ³ Royal College of Surgeons of England (1997) The provision of emergency surgical services. An organisational framework. London, RCS.
- ⁴ A good example of this is found in an early Effectiveness Bulletin (The management of subfertility, Effective Health Care 1992, no 3.
- ⁵ See Dowie and Gravelle (1997) p.60 for a simple mathematical statement of the relation between sub-specialism and concentration.
- ⁶ British Medical Association, Royal College of Physicians of London, Royal College of Surgeons of England (1998), Provision of acute general hospital services. London, RCS.
- ⁷ College of Paediatrics and Child Health (1996), Future configuration of paediatric services. London, CP&CH.
- ⁸ NHS Executive (1996), Maternity Services Liaison Committee: guidelines for working effectively. Leeds, NHSE.
- ⁹ Davis and Whinston (1967), Piecemeal policy in the theory of the second best, Review of Economics Studies, July 1967.
- ¹⁰ Royal College of Obstetricians and Gynaecologists (1998), The initial investigation and management of the infertile couple. Evidence-based clinical guidelines no 2. Guideline summary. London, RCOG.
- ¹¹ See for example HM Treasury (1991), Economic Appraisal in Central Government: a technical guide for government departments.
- ¹² Environmental impact statements were first required in the US by the Environmental Protection Act 1965 and in the UK by the 1985 Council Directive 85/337/EEC.
- ¹³ See for example Department of the Environment (1995), Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment: A good practice guide.
- ¹⁴ See ⁶ above.
- ¹⁵ See NHS Executive (1996), Clinical guidelines - use of clinical guidelines for improving care in the NHS.

Figure 1

THE INVESTIGATION AND MANAGEMENT OF THE INFERTILE COUPLE IN PRIMARY CARE

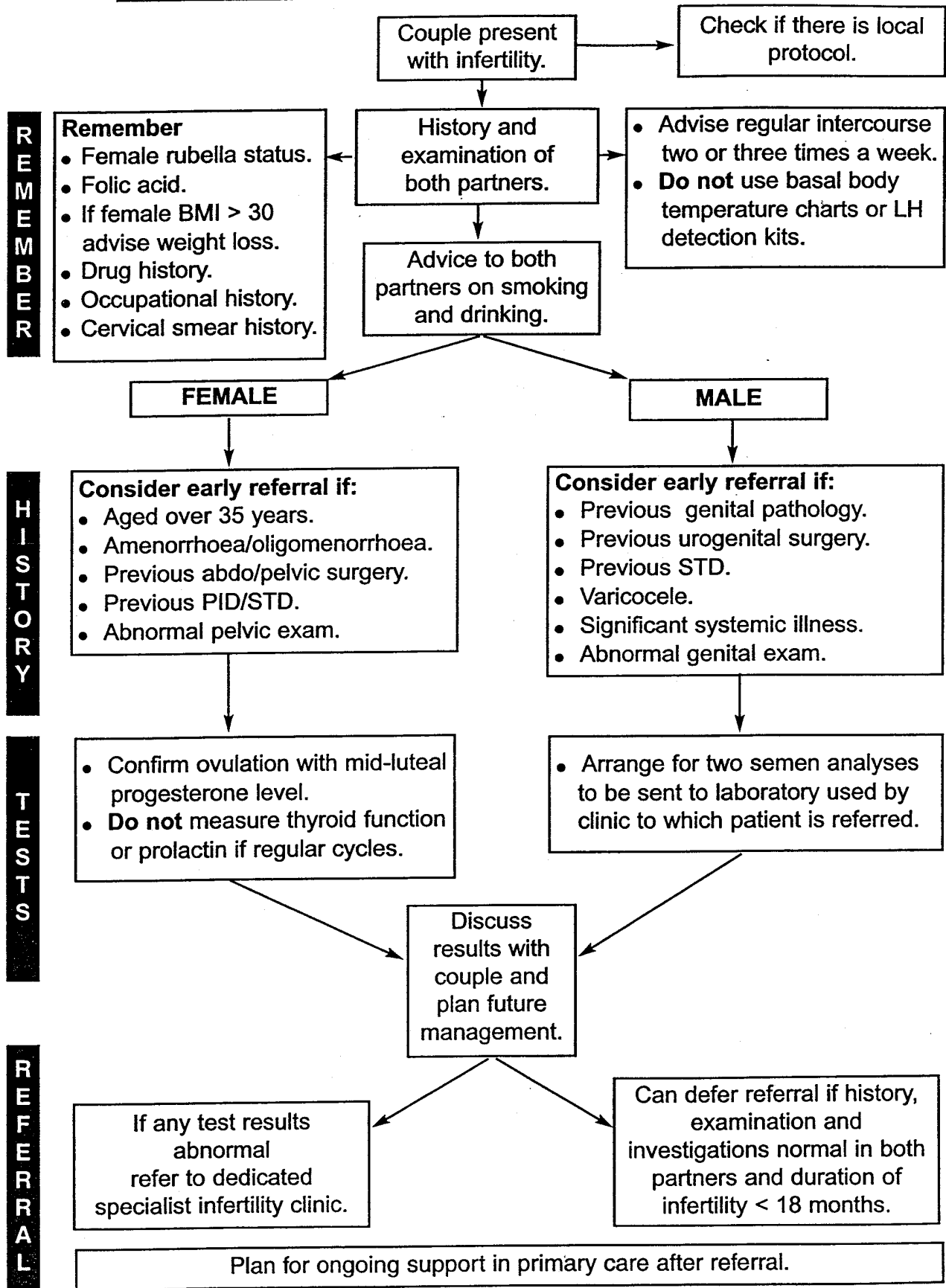
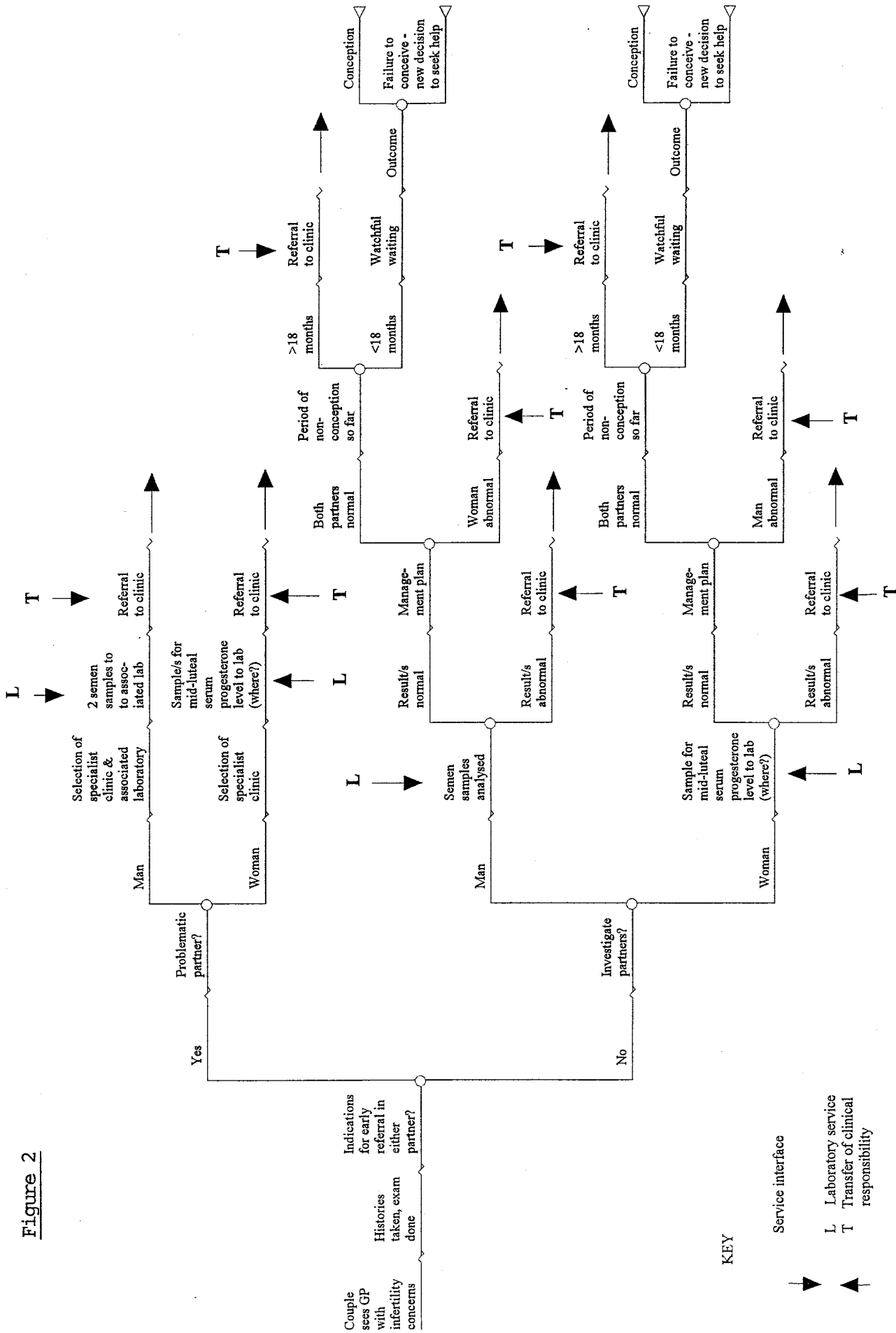


Figure 2



Event Framework based on the RCOG's Guidelines for the Initial Investigation and Management of the Infertile Couple: Guideline Summary, 1998

Note: No account has been taken of multiple occasions when partners attend for test sampling.