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Independent Review of the Congenital & Paediatric Cardiac Services at Bristol Royal Hospital for Children & Bristol Royal Infirmary

Dr. Michael Godman
Reviewer

Mr. Roger Mee
Reviewer

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Introduction

1. The reputation of Bristol Royal Infirmary, and in particular of the Paediatric Cardiac Services, was severely damaged when it became public knowledge that the management of children receiving complex cardiac surgery was seriously inadequate. The Bristol Royal Infirmary Inquiry, chaired by Professor Ian Kennedy, was established in October 1998 to look at all issues related to children receiving complex cardiac surgery between 1984 and 1995.

2. The Bristol Royal Infirmary Inquiry was concluded in July 2001 and identified what had gone wrong, and made strong recommendations relevant to the services at Bristol Royal Infirmary and to the provision of paediatric cardiac surgery. These recommendations have been recognised as relevant to all of British medicine.

3. The wide publicity associated with the Inquiry indicated the need for important changes in accountability and highlighted that Bristol was not alone as an institution in which there should have been greater care in dealing with high risk patients. Inquiries into the services at Royal Brompton and Harefield NHS Trusts highlighted the importance of the Bristol Inquiry Recommendations.

4. The government set-up a review group in January 2001 to make recommendations and set standards for the organisation of Paediatric and Congenital Cardiac Services. In making its recommendations the group believed that services which operated to the specific standards which they proposed would command the confidence of patients and

parents and provide the best chance of preventing the tragic events in Bristol ever happening again.

5. The legacy of the events which led to the Inquiry has been good for Bristol Medicine but inevitably Bristol has to remain “ahead of the game” for many years to come. The desire to be better and to be seen much better may, however, create problems in terms of excessive sensitivity when responding to circumscribed adverse clinical incidents which can never be completely eliminated.

6. The appointment of a new cardiac surgeon, Mr. Ash Pawade in 1995 largely corrected the deficits in cardiac surgery. As the result of his very good surgery and efforts of many colleagues across the clinical and administrative spectrum the perception amongst many informed observers was that Bristol had been substantially turned around by 2001. Mr. Pawade withdrew from operating on neonates and infants (under 1 year) in December 2005 because of illness, and had to stop altogether in February 2007.

7. Follow up review is of course mandatory for Bristol. The need for the current review has been commissioned by the Trust. The review was suggested because it would give an opportunity to see if the quality of service improvement produced by Mr. Pawade and his colleagues since 1995 has been maintained; if not the review would provide an opportunity for the Trust to deal with the concerns raised and to take appropriate action.

8. Dr. Michael Godman, Pediatric Cardiologist and Mr. Roger Mee, Cardiac Surgeon, were invited to conduct an external review on behalf of the United Bristol Health Care NHS Trust.

Conduct of the Review

1. The reviewers were provided with background briefing papers including statistics, the clinical services strategy, corporate objectives and service profiles from the various subspecialties and supporting services relating to Paediatric Cardiology and Cardiac Surgery.

2. The reviewers were given a conducted tour of the Bristol Children's Hospital to establish the functional relationships within different departments.

3. Tabled meetings were held with key staff in all Departments. The reviewers attended weekly conferences and activities including the Joint Cardiac Conference, the Radiology Meeting and Ward Rounds. Visits were made to the wards, PICU, cardiac catheter suite, echo, cardiac theatre, MRI-CT and to the fetal service at St. Michael's Hospital.

4. Individual meetings were held with the members of staff listed below and in addition, with Dr. Jonathan Sheffield the Trust Medical Director, and with Dr. Graham Rich, the Trust Chief Executive Officer.

Dr. Jackie Cornish	Head of Division, Division of Women & Children's Services

Geraldine Johnston	Divisional Manager, Division of Women & Children's services
Dr. Andy Tometzki	Paediatric Cardiologist & Lead Doctor
Anne Miller	Modern Matron
Dr. Alison Hayes	Paediatric Cardiologist
Sue Simpson	Chief Paediatric Cardiology Technician
William Lansdowne	Perfusionist
Dr. Peter Davis	Paediatric Intensivist & Lead Clinician
Dr. Ian Jenkins	Paediatric Cardiac Anaesthesia/ Intensivist
Prof. Andy Wolf	Paediatric Cardiac Anaesthesia/ Intensivist
Cathy Harington	Cardiac Liaison Nurse
Karen Sheehan	Cardiac Clinical Nurse Specialist
Dr. Robert Martin	Paediatric Cardiologist
Dr. Rob Tulloh	Paediatric Cardiologist
Dr. Peter Wilde	Head of Division, Division of Specialised Services
Dr. Bev Tsai-Goodman	Paediatric Cardiologist
Dr. Graham Stuart	Cardiologist – Paediatric & GUCH
William Booth	Senior Nurse/Matron, PICU
KD Meeting Room	King David Meeting Room, King David Building
KD Building	King David Building

5. The review was conducted from Monday 1st October 2007 to Friday 5th October 2007.

Congenital Cardiac Services

Medical

1. In 1993 Medical Paediatric Cardiology Services were provided by three (3) Consultant Paediatric Cardiologists with no supporting junior staff. Currently the unit has six (6) Consultant Paediatric Cardiologists, one (1) GUCH Cardiologist, four (4) career paediatric cardiology registrars, two (2) general paediatric SpR's, three (3) ward doctors and three (3) junior GUCH positions - one (1) full time SpR, one (1) part time SpR and a staff grade physician. The service transferred to the new Children's Hospital in April 2001. Also, in 2001 Welsh interventional work was transferred to Bristol Children's Hospital as part of a managed network. There has been progressive sub-specialisation within the consultant group for interventional cardiology, echocardiography, MRI-CT, fetal cardiology, pulmonary hypertension, arrhythmias and GUCH work.

2. In-spite of a number of issues and challenges the transformation in medical services has been striking and with minor qualification it could be claimed that all the recommendations made in the Kennedy report have been implemented. This is a very substantial achievement and reflects great credit on all staff involved.

3. The population base for the Bristol Congenital Cardiac Service has increased from 3.5 million to 5 million since the merger with Cardiff and South Wales. There is wide spread, though not universal, evidence of cohesive working within the congenital cardiac services. The reviewers were surprised that cardiac consultants from Cardiff were not participating in the review.

Recommendation: *Re-assessment of present integration and unified working between the centres.*

4. Despite evidence of good overall team working, the reviewers were struck by a general sense of frustration and resignation on the part of senior members of staff at their apparent inability to maintain the pace of change required in an expanding service and to correct identified deficiencies. These cumulative deficiencies are set out in the various sections of the report.

5. Of the six (6) consultants 4 have 15 PA sessions in their job plans i.e five (5) more than the basic ten (10) session contract; this reflects the heavy work load associated with outreach clinics and the disparate nature of the service which most of the individuals attempt to provide**.** One of the six (Dr. Stuart) has commitments which are currently principally in the Grown Up Congenital Heart Disease Service (GUCH). The workload in Bristol is excessive.

Recommendation: *The appointment of an additional consultant in paediatric cardiology. It should be addressed by management with urgency. The needs of the GUCH service require separate consideration.*

6. The cardiology ward has 16 funded beds with a capacity to increase to 18 beds and is child friendly physically, although physically space is limited. There is pressure on admissions from time to time. There is a fold down bed for a parent at the side of each child's bed. Every effort, however, is made to keep the family together, particularly at the time of surgery: Family accommodation is available in Ronald McDonald House.

Recommendation: *Additional work is required to determine whether high dependency non-ventilated patients can be accepted from the PICU without compromising the admission of patients for cardiac catheterisation or pre-operatively.*

7. Training, parent information, staff development, and educational programmes appear to be well developed. Staff are closely involved in parent support groups and nationally with the Paediatric Cardiac Nurses Association. Compliance with the standards set out in the National Congenital Cardiac Review Group of 2003 seems to be high.

8. The cardiac catheter laboratory is well equipped with appropriate infrastructure. The current equipment was installed in 2001 and it is likely it will require replacement in two (2) to three (3) years from now. Assessment from shorts visits (1 - 2 hours) showed no significant deviation from safety standards or acceptable working practices. There is a wide range of interventional cardiac procedures. There are six (6) catheterisations per week with GA provision for all cases. Anaesthetic cover is not always provided at consultant level. The Paediatric Cardiologists responsible for interventional work are all

well trained and highly experienced. The range of procedures performed compares well with those of the best centres nationally and internationally. Additional support for diagnostic catheterisation is provided by Dr. Tulloh and Dr. Graham Stuart. An active program of paediatric and adult congenital radio frequency ablation procedures is conducted by Dr. Stuart. Although the catheter laboratory is staffed by a dedicated paediatric cardiac nursing team and by paediatric physiologists there is shared cardiac radiographer cover with adult services. The adult congenital catheter service is provided within the adult catheter lab suite with one (1) full day every two (2) weeks. With increased pressure on waiting times this has been increased on an ad-hoc basis to approximately two (2) sessions per week.

9. The current six (6) sessions of paediatric catheter work are not always adequate and there are frequently particular difficulties in fitting-in urgent cases. These difficulties are exacerbated because radiography support is shared between the paediatric and adult services. When out of hours work is required the radiographer may be shared between a primary angioplasty service and an emergency infant cardiac catheterisation. There is a need therefore, to increase the radiography service so that two (2) labs can be run simultaneously. Catheter sessions for patients with congenital heart disease need to be increased if future developments such as a hypoplastic left heart syndrome (HLHS) program and the planned development of a pulmonary valve replacement program are to be accommodated.

Recommendation: *The provision of additional radiography staff and catheter sessions is required if the increasing clinical work load is not to result in excessive waiting times.*

10. Dr. Rob Tulloh was appointed with a remit to develop and lead the pulmonary hypertension service in 2005. Although he has established a solid service for children with primary or acquired pulmonary hypertension the Bristol service has not been accorded recognition as a national centre. Apart from Great Ormond Street Hospital no other children's centre in the U.K has such a well developed pulmonary hypertensive service.

Recommendation: *Higher recognition for the Bristol service may be accorded if Dr. Tulloh developed the service jointly with adult cardiology or developed his working partnership with Hammersmith Hospital.*

11. Dr. Tulloh has a good research record.

Recommendation: *he or another identified individual should be encouraged to develop a lead role in improving the academic profile of paediatric cardiology and consolidate the role of research coordinator particularly for junior staff.*

Echocardiography/ MRI / Physiologisy/ Fetal

1. The non-invasive cardiology service is severely constrained by space. Uncomfortable conditions exist for staff, children and accompanying parents.

Recommendation: *These space constraints should be reviewed with the specialist Paediatric Transfer.*

2. Two (2) echo machines an IE133 and Vivid 7 have been purchased relatively recently in August 2005 and July 2007 respectively. Two (2) machines [HP 5500] are more than six (6) years old and require replacement within the next 12-18 months. To achieve Euroecho / BSE accreditation for an echo lab all machines should be less than five (5) years old.

3. There is a modern reporting system (Heartsuite) but there is not a digital archiving / PACS system for viewing and storing images. This is valuable for the management of anything more than a small volume department.

Recommendation: *The purchase of a system such as Enconcert / Accelera should be given a high priority.*

4. A transoesophageal probe/ probes for echo studies should be available at all times in the operating theatre. Recognition for the need for consultant time for echo studies in theatre should be made. At present this level of service would not be regarded as optimal by most centres.

Recommendation: *Identification of protected consultant time for transoesophageal echo time in Theatre required. A transoesophageal probe should be available in Theatre at all times. The purchase / provision of a small portable echo machine (with probe) such as the Vivid I would provide the best solution.*

5. Officially there are 4.78 WTE physiology technicians but only 3.58 WTE have the skills to perform echocardiography studies. It appears that they are considerably over burdened but hard statistical evidence needs to be produced to sustain the claim. At the time of the review the reviewers were informed by staff that of 4.8 WTE physiologists only 2.8 WTE had the skills to perform echocardiography.

Recommendation: *Review of evidence and need for additional physiology technicians.*

6. The physiology services has no secretarial support and believe that the divisional training budget is inadequate. Echocardiographic equipment, technology and its applications advance rapidly and this should be reflected in the provision of training opportunities.

Recommendation: *Greater focus and awareness of need for continuing professional development.*

7. The MRI sessions are provided at Bristol Royal Infirmary. Five (5) general paediatric sessions for BCH are provided; three (3) of these have GA cover but are not allocated to cardiology.

8. It is unlikely in the near future that there will be more cardiac MRI sessions available at Bristol Children's Hospital but there is an increasing demand on this service. It is probable that cardiac MRI will be available at the Bristol Heart Institute. ***Recommendation****: If the future needs of paediatric and adult congenital cardiac patients are to be met more MRI sessions will be required. If these cannot be met within the Bristol Children's Hospital consideration should be given to the provision of sessions at the Bristol Heart Institute.*

9. Dr. Tsai - Goodman would appear to have limited scheduled access to cardiac MRI sessions. This seems wasteful of her experience and expertise.

Recommendation: *Review of Dr. Tsai- Goodman's sessions.*

10. The fetal cardiology service is principally at St. Michael's Hospital. One reviewer (Dr. Godman) met with Mr. Tim Overton and Mr. Mark Denbow. The service is well organised and structured and has taken account of European recommendations. The staff are enthusiastic and committed to improvement. A telemedicine service to Truro is working well and will be rolled out to other areas in 2008. Communication with referring centres seems excellent.

Recommendation: *This is an impressive service but to optimise its achievements.*

- *Appointment of additional radiographer technician for straight forward cases.*
- *A dedicated rather than shared echo machine for urgent referrals.*
- *Additional consultant time for counselling and training.*

Adult Congenital Heart Service

(GUCH)

1. Adults with congenital heart disease now out number children with congenital heart disease. There is a need for similar investment in adult congenital cardiac services as there has been in children.

2. There is no longer the optimism of twenty (20) years ago that cardiac surgery can be curative for complex congenital heart disease; most problems require life long supervision and management.

3. Currently the increasing populations of adults with congenital heart disease are cared for by three (3) consultants. Dr. Stuart is lead consultant with a special interest in Grown Up Congenital Heart Disease: 80% of his time is committed to adult patients. Dr. Martin has sessional and on call commitments to adult work. Dr. Turner is a full time Adult Congenital Consultant.

4. The adult service is comprehensive and has clearly identifiable strengths. Dr. Turner and Dr. Martin are highly experienced in interventional catheter techniques. Dr. Stuart provides strong support and expertise in pacemaker therapy and electrophysiology.

5. The administrative structure for the service has been well conceived but problems occur because of unacceptable delays in areas such as secretarial support (some letters waiting up to six (6) weeks). These operational issues produce an erosive frustration.

6. This service requires strong support because this is a growing population of complex patients. The medical surgical and nursing expertise is available to make it one of the best in the U.K.

Recommendation 1: *Planning for the transition of patients between Bristol Children's and the new Bristol Heart Institute should accord a high priority to the needs of this group of patients including in-patient provision for adolescents and protected cardiac catheter sessions.*

Recommendation 2: *For some few complex congenital cardiac surgical lesions consideration should be given to operating on adult cases in Bristol Children's Hospital where greater clinical experience in management is available. This should be until such time as the GUCH service is fully facilitated, staffed and funded, and is large enough surgically to warrant in depth specialization of the whole team in the Bristol Heart Institute.*

Cardiac Perfusion Services

1. The reviewers met with Mr. William Lansdowne from the cardiac perfusion services. The Chief Perfusionist, Mr. Richard Downes is currently suspended. It was not the remit of the reviewers to examine the circumstances of Mr. Downes suspension. Inevitably they could not fail to know the circumstances had and continue to have an obvious effect on morale and confidence. This is not only amongst the perfusion staff but in surgery and anesthesia. The reviewers are unable to comment on the appropriateness of this but there is a wide spread sentiment that management did not handle the process of this critical incident well.

2. The current funded staffing establishment allows for 8.77 perfusionists to cover the congenital cardiac services. These are provided from the main hospital. Five (5) of the perfusionists provide the on-call service; the on-call rota is split between two (2) sites and the on-call individual may have to cover both the paediatric and adult service with potential conflict. This arrangement is clearly unsatisfactory to all. Once a cardiac surgical operation is underway the perfusionist may not be available for several if not many hours.

***Recommendation**: That there be an increase in the numbers of perfusionists available for routine cases and that there is a separate on-call service for paediatric cardiac perfusion.*

3. The perfusionists expressed their frustration with the organisation within the cardiac theatre and in particular the delays produced by a slow anaesthetic service. They were not alone in expressing the opinion that there seems to be “no one pushing cases through.”

4. There is no structure for the delivery of ECMO. This service is required irregularly but it makes it all the more important that there is a clearly recognised policy for the delivery of the service in the first 24 to 48 hours after the patient is placed on ECMO.

Without a clear policy defining post-operative roles and responsibility patients are potentially at risk.

Recommendation: *Review of the provision of ECMO.*

5. The reviewers did not have the opportunity to examine carefully the work practices and roles of the cardiac perfusionists. Some of these issues may have been identified in the root cause analysis conducted in the wake of the critical incident leading to the chief perfusionist’s suspension. It is obviously a matter of paramount importance for that there be sound policies available which define the working practices of all members of the cardiac theatre team.

Recommendation: *Development of clear policies which define roles and responsibilities of all staff within the cardiac theatre.*

Cardiac Surgery

1. High quality cardiac surgery is essential for the success of any Congenital Cardiac program and the aspired benchmark standard should be international rather than local.

2. Since the appointment of Mr. Ash Pawade in 1995 excellent surgical results have been achieved at Bristol Children's Hospital. At an early stage Mr. Pawade's results were available for public inspection. With the support of Dr. Alison Hayes, all data were validated and open publication did much to increase confidence in Bristol Children's Hospital. In more recent years the data has been submitted to the Central Cardiac Audit Data Base (CCAD) for audit externally. Although the results compare well with other centres in the UK it is important to recognise that for less common lesions the Central Cardiac Data Base does not allow for ready analysis of case mix or risk stratification.

3. Currently the unit is staffed by two consultants, Mr. Andrew Parry and Mr. Massimo Caputo. Mr. Pawade withdrew from operating on neonates and infants (under 1 year) in December 2005 because of illness, and had to stop altogether in February 2007. The published figures for 2006 and those available for 2007 suggest that his high standards have been maintained.

4. Within the surgical unit, however, there is significant concern that these good results are masking a number of major inefficiencies, which if not resolved, will impact on patient care.

5. Operating time is limited to three (3) full days – six (6) sessions plus an additional full day on alternate weeks for adult congenital cardiac patients. Out of hours the Cardiac Surgical service has to compete with orthopaedics, ENT and General Surgery. This constraint is inappropriate for a specialty where immediate theatre access may be required 24 hours a day and is not a foundation for the continuing development of the service. Within the theatre there are only three dedicated Cardiac Nurses; there is a need therefore to increase the pool of those with experience and expertise. There is a particularly long gap in theatre time between Thursday and Monday morning. A Friday morning list for the Surgeon on call on a rotating basis could be a start in increasing theatre availability.

6. The limited theatre time for Cardiac Surgery is not well organised. There is widespread frustration on the part of surgeons, nurses, perfusionists and some anaesthetists about the inefficient use of the available time. Nurses are available from 7:30 a.m. but some cases may not start until 8:30 or later because of anaesthetic delays. Slow turn over between cases means a second case may not start until 4:00 o'clock in the afternoon. If these inefficient work practices exist in Cardiac Anaesthesia and Cardiac Surgery it seems to the reviewers that they are likely to be repeated in other areas of the theatre service. The potential for improvement in efficiency therefore would seem obvious. There seems to be an inability, in spite of recognition, to resolve the problem.

Recommendation: *Clinical and managerial review of efficiency of current work practices.*

7. An inappropriate number of Cardiac Surgical cases are cancelled -30% and possibly as high as 40% from time to time. Some of the causes were identified to the reviewers but not all. This does not seem to be dealt with as a matter of urgency. The impact of late cancellation of Cardiac Surgery can have a devastating effect upon a family. It would be wrong to suggest that the staff are not sensitive to this but at all levels (management, medical, surgical and nursing collectively) the unit appears to have become inured to the consequences for families.

8. Morale within Cardiac Surgery is not high. This is contributed to by issues in relation to the suspension of the Chief Perfusionist and loss of confidence in management support. Mr. Pawade's departure and operational difficulties combine to give an impression of a surgical unit that lacks direction. Retention of staff is vitally important. There is a need therefore to focus with urgency on the future staffing requirements, at consultant level in particular. Someone moreover must be clearly identified as being in-charge and providing leadership.

Recommendation: *Review of consultant staffing.*

9. The unit must develop its academic focus. This may be best achieved through stronger links with the Academic Department of Cardiac Surgery. Opportunities must be identified for combined working. The opening of a new Bristol Heart Institute within the next 2 to 3 years should be an opportunity for promoting such developments.

10. Serious consideration must be given now to developing a clear strategy for the development of the Pediatric Cardiac Surgery unit. It is likely that in the near future there will be a national review of the number of units offering Pediatric Cardiac Surgery in England and Wales. There may be a recommendation that will suggest contraction to five units. An opportunity exists for Bristol to become the provider of services for South West England and South Wales. The Trust needs to consider what developments are necessary to enable Bristol to stake its claim to be one of the national centres. Significant constraints in terms of space exist within the present Children's Hospital. Re-organisation of space allocation may be necessary for Bristol to make a claim to be one of the five (5) or six (6) national cardiac units. With the development of a new Bristol Heart Institute and the transfer of services from Frenchay hospital a review of space usage should be instituted.

Recommendation: *Strategic review of the provision of congenital cardiac services over the next 5-10years from a local, regional and national view. This should take account of the possibility of closure of units within the U.K. which may or may not include Bristol.*

Cardiac Anaesthesia and Paediatric Cardiac Intensive Care

1. The reviewers met with Professor Andy Wolf and Dr. Ian Jenkins. Both participate along with other Anaesthetists and Intensivists in running the 18 bed, Paediatric Intensive Care Unit. There are no dedicated or "ring fenced" cardiac surgical or pediatric cardiology beds. There are two consultants on call each night for paediatric intensive care which usually includes one (1) Cardiac Anaesthetist and two (2) fellows. The intensive care unit provides an outreach service. There is a consultant round each evening at 10 o'clock.

2. There is recognition that bed usage is not optimal and that there is room for increased efficiency. It is not yet clear how this can be obtained. The development of an area for high dependency patients in ward 32 could achieve this but space constraints exist there also. Clearly defined protocols for the fast tracking of patients might help as would the development of a transitional nursing team and protected time for a pediatric cardiologist to participate in individual patient decision making.

Recommendation: *Develop protocols for fast tracking and consider establishing a "Transitional" nursing team to facilitate the care of more high dependency patients in Ward 32 or elsewhere if an area can be identified.*

3. It was highlighted that there is no clear mechanism for responding rapidly to unforseen events. Problems are often discussed many weeks later at mortality – morbidity conferences when the cause and course of events cannot be clearly identified and analysed.

Recommendation: *There is a need for clearer policies to ensure morbidity issues are discussed in a more timely fashion.*

4. From time to time there is a need to provide ECMO support in the PICU. This may only happen 2 or 3 times a year but optimally a Perfusionist should provide cover for at least the first 24 hours. A perfusionist may not always be readily available.

Recommendation: *Establish a policy for the management of ECMO.*

5. There is a perception by the cardiac anesthetists that support for their service is less than formerly. In particular they feel that specialised nursing, anaesthetic, technical support, and junior medical rotations are all fragmented. Cases do not proceed as expeditiously and efficiently as expected in a well organised Cardiac surgical centre.

Recommendation: *Clinicians and management need urgently to review current work practices.*

6. Operational deficiencies and the effects of the critical incident which occurred with cardiac perfusion in 2005 have contributed to low morale amongst Cardiac Anaesthetists. They, like others, expressed a strong sense of individual vulnerability and the need for management and others to understand the unique complexity of the problems that have to be faced daily by any team which manages complex congenital heart disease.

Conclusions and Recommendations

1. The Paediatric Cardiac Services at Bristol Children's Hospital were hit hard in 1995, when it became apparent that cardiac surgery was poor, that the surgeons and the rest of the multidisciplinary team were inadequately alarmed at this and that the hospital administration did not seem to know that they were presiding over an unacceptably high mortality.

2. The appointment of a new cardiac surgeon, Mr. Ash Pawade, and team in 1995 strikingly improved the outcome of infants and children having cardiac surgery. The subsequent implementation by the Trust of the recommendations of the Kennedy report (2001) and of the report of the Paediatric and Congenital Cardiac Services Review Group in 2003 transformed the working practices of the congenital cardiac services offered by Bristol. The move to a new Children's Hospital in 2001 and the support of management contributed to a feeling of growing confidence internally and externally in the quality of services provided by Bristol Children's Hospital. The effort of many people across the clinical and administrative spectrum was responsible for this transformation.

3. Follow-up reviews should of course remain mandatory for Bristol. Importantly the senior surgeon Mr. Pawade has had to stop operating because of illness. In the last few years concerns have again emerged, albeit internally, of a lack of momentum. Despite this there is the maintenance of better than average surgical outcomes. There is anxiety from some staff that failure to maintain momentum could potentially affect standards.

4. It is important in these conclusions to emphasise that the reviewers were impressed that much excellent work is being undertaken by many fine and talented doctors, nurses and supporting clinical and management staff. These have all contributed to the maintenance of the quality surgical outcomes.

5. The Trust and Bristol Children's Hospital clearly desire that the congenital cardiac services be seen as a centre of clinical excellence. As a consequence the "bar" is inevitably set high by national and international standards.

6. Against this background the reviewers were struck that "the bounce has gone out of the step" across much of the multidisciplinary team. The reviewers observed multiple small but cumulative deficits and a clearly elevated index of frustration and even anger amongst a few key team players. If left uncorrected this will limit the potential of the unit to expand and achieve higher standards. For many staff there is a growing apprehension about the future and to some degree a partial withdrawal of full commitment. There is a need for clinical staff and management to reengage in identifying solutions to the problems which may be impeding the progress of the paediatric cardiac services

7. The reviewers believe that there are few, if any, disciplines which require and need as close committed multidisciplinary working as paediatric cardiology and surgery, if the outcome is to be successful. The complexity and multiple steps involved in bringing a new born infant with complex congenital cardiac disease through cardiac surgery

successfully can be likened to the launching of a space satellite. Each member of the team involved in such a venture is aware not only of the vulnerability of the patient but also of his or her individual responsibility.

8. There is the emergence of a “them” and “us” culture. As a result there is a reluctance to even bother to mention deficits because “nothing can be done about them” and “where is the money going to come from”? This response is pervasive at all levels in the team.

9. There is uncertainty on the part of almost all individuals as to what process exists to fix problems and to move forward. This is inevitably giving rise to increasing inefficiencies in delivering parts of the cardiac service. It is recognised that many problems are complex and multifactorial and common to many parts of the NHS.

10. Importantly, there is an unacceptable rate of surgical cancellations producing an accompanying waste of manpower and a hurtful level of emotional trauma to the parents and families as well as to caring members of the therapeutic team. This is not good for anyone.

11. The organisational structure therefore is seen as creating unnecessary difficulties in delivering a highly and demanding service at a time of increasing public expectations. A high level of responsibility and accountability is expected but with a perceived low level of authority to effect needed changes.

12. There needs to be greater fiscal transparency. This cannot be achieved before management itself understands the cost and costing of the service. Without this detailed knowledge no service can plan. This is a national problem.

13. Bristol has many factors working in its favor. Its administration is sensitive to the need for constant improvement to avoid past problems but it has to some extent become disconnected, at least temporarily, from the staff delivering this service. There is clear evidence of quality in many of the areas of the service and this provides an excellent basis for creating a true centre of excellence. The implementation of a strategic plan which would take account of the possibility that there may, in the future, be fewer centres nationally providing congenital cardiac services is of paramount importance. Bristol is well placed geographically to be a national centre. The opportunities provided for the development of GUCH services with the opening of a new Bristol Heart Institute are considerable.

14. A debilitated cardiac service (1995) is not rectified by a single “fix”, but requires an ongoing dynamic, constantly active administrative system to encourage and implement continuous refinement. The reviewers are concerned that there are worrying early signs that this process may be stalling.

15. The principal specific recommendations within the report can be summarised to include the following:

- The development of a strategic plan which recognises there may in the future be designated national paediatric cardiac centres. Bristol may lose its status as a regional centre if it does not plan appropriately.
- Assess the need for a third or even fourth surgeon. This should take account of European directives on working hours as well as the increasing GUCH load and the desire of the Trust (if this is the case) to be potentially a national cardiac centre.
- The Children's Hospital management team along with the lead physician and other senior members of the clinical staff need to resolve collectively the multiple minor inefficiencies which cumulatively are producing so much frustration.
- Additional appointments are clearly required to maintain the present service. These include, but may not be confined to, an additional consultant paediatric cardiologist, a new consultant for the GUCH service and supporting staff such as two (2) additional perfusionists, secretaries and additional cardiac physiology and radiography staff.
- Additional investment in imaging technology to include intraoperative echocardiography, digital archiving and increased sessions for cardiac catheterisation and MRI.
- Further training should be provided for those adopting leadership roles in paediatric cardiology and cardiac surgery.
- Stronger research links need to be forged with the academic departments of cardiology, cardiac surgery and other related disciplines.

16. This report was commissioned with a view to identifying how the paediatric cardiac services can be improved. The purpose of these recommendations is to highlight what needs to be done.