



Time to celebrate.

Image reproduced with kind permission from Rachel's parents.

# *Children's Acute Transport Service* **Annual Report 2009-2010**

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## Executive summary

### Highlights: 2009/10

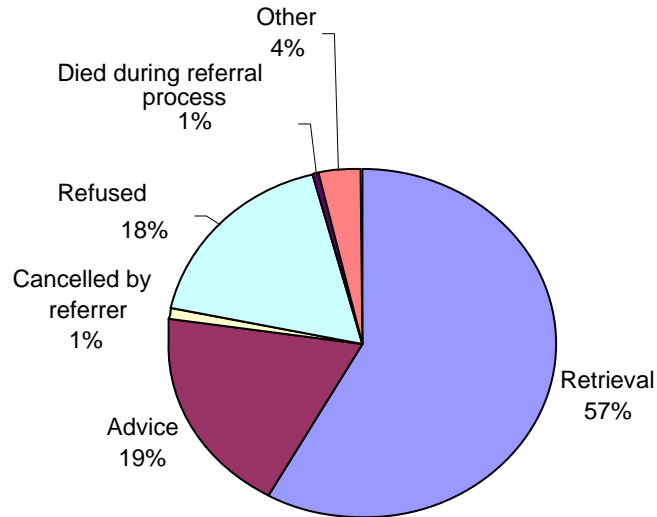
- ❑ The service entered its ninth year of providing dedicated specialist paediatric intensive care retrieval services for the North Thames region.
- ❑ In 2009/10, CATS handled **2080** referral calls and performed **1059** critical care retrievals.
- ❑ CATS achieved external accreditation for its service delivery in January 2010, following international peer review by Commission on Accreditation of Medical Transport Systems (CAMTS). CATS is the only European service to achieve this designation.
- ❑ The service continued to expand nursing roles in paediatric retrieval with its ANP programme for retrieval training. There are now 3 Advanced Nurse Practitioners who have completed their training and lead retrievals.
- ❑ A number of research articles were published in prominent peer-reviewed journals and CATS staff presented at various national and international conferences
- ❑ A number of innovative IT developments were piloted at CATS to improve patient care and the efficiency of the service.
- ❑ During the H1N1 pandemic, a massive flu education programme was undertaken by CATS/GOSH/SMH PICUs to the adult and paediatric sector networks in the region
- ❑ CATS made their television debut: The BBC commissioned a series of 8 programmes about the service which was aired in May 2010 to critical acclaim and won the highest viewer ratings in the time slot.

## Summary of activity: 2009/10

CATS provides a single point of contact for advice, bed finding, and a paediatric retrieval team for acutely ill children needing intensive care.

Total referrals received: 2080  
 Total team mobilisations: 1059  
 Total transfers to PICU: 1017

### Breakdown of referrals and their outcome



### Destination ICUs for patients transported by CATS

Receiving Hospitals	Number
Great Ormond Street Hospital	456
St Mary's Hospital	217
Royal Brompton Hospital	108
Addenbrookes Hospital	81
Evelina Children's Hospital	38
St George's Hospital	25
King's College Hospital	24
St Andrews Burns Centre, Broomfield	6
ECMO Centres (Not GOSH)	11
ECMO Takebacks/Other	24
Southampton/Oxford PICU	8
Royal London PCCU	19

## **Background**

The Children's Acute Transport Service is a specialised service designed to make intensive care rapidly available to critically ill children in North Thames and East Anglia.

Most hospitals do not have a Paediatric Intensive Care Unit (PICU) - paediatric intensive care is only provided in a small number of specialist units. However, most critically ill children initially present to hospitals without a PICU. The Children's Acute Transport Service (CATS) facilitates the safe and speedy transfer of these children to a PICU.

CATS deploys a skilled paediatric intensive care team to assist in the treatment of critically ill children both before and during transfer to ICU. We offer telephone consultation, liaison with sub-specialists and skilled inter-hospital transport within one service.

## **Mission Statement**

The Children's Acute Transport Service (CATS) has been operational since 1st November 2001. The service fulfils the recommendations outlined by the Department of Health document: Paediatric Intensive Care - "A Framework for the Future" (1997)<sup>1</sup>.

The Children's Acute Transport Service aims to provide the highest quality paediatric intensive care for children and their families from the first point of contact to the final unit destination.

The service:

- Provides easy access and service coordination for referring children's units
- Facilitates improvements in transport provision for critically ill children
- Provides the flexibility to meet fluctuating demands
- Provides telephone advice and a triaging facility for all referrals
- Facilitates the delivery of the most appropriate care in the most appropriate place for any infant or child requiring Intensive Care in the North Thames and East Anglia region.

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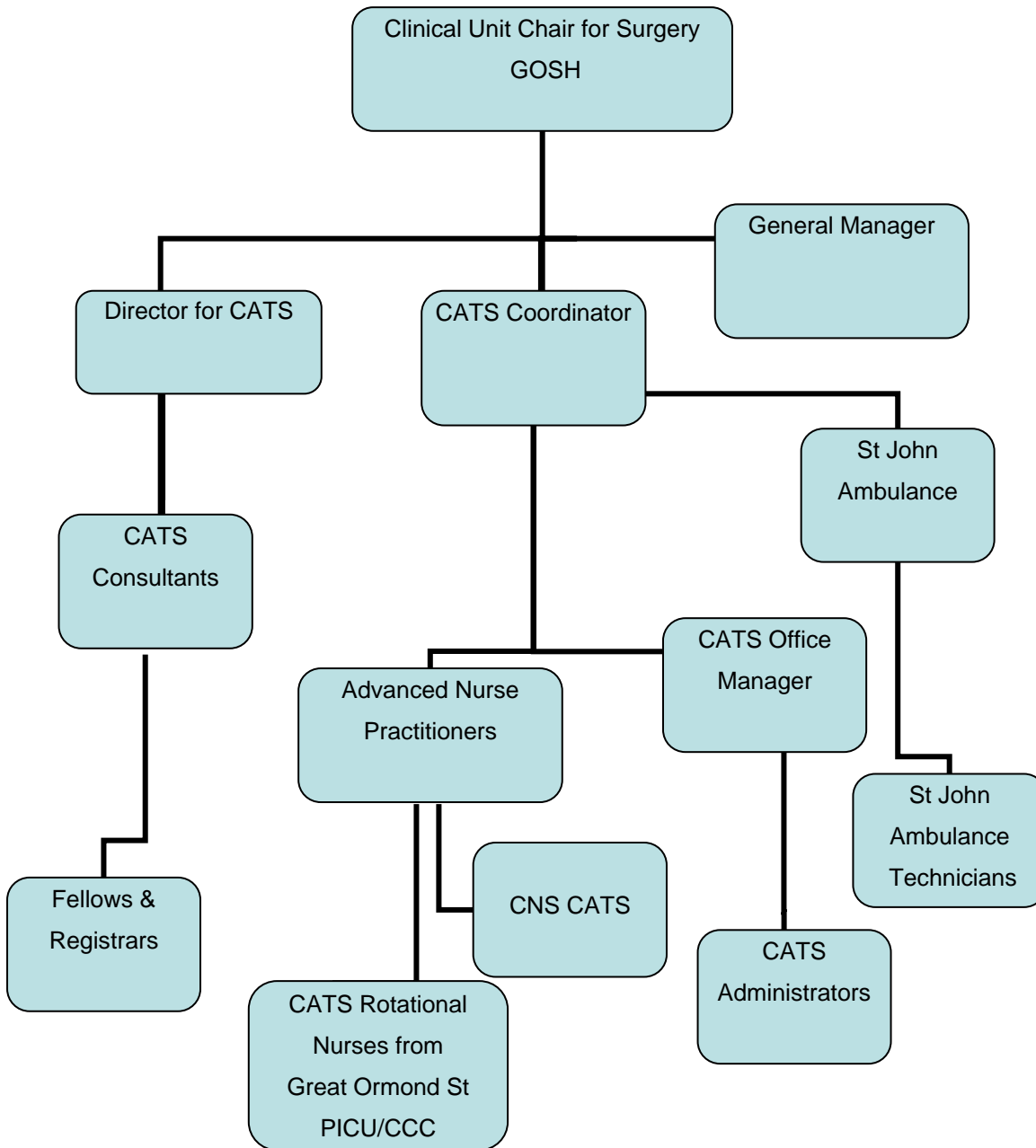
<sup>1</sup> Paediatric Intensive Care "A Framework for the Future" Report from the National Coordinating Group, *Department of Health*, 1997.

## Service Standards

The following core standards apply:

- ❑ All infants and children requiring critical care will receive the appropriate treatment, in the right place, at the right time
- ❑ CATS will undertake to find an appropriate paediatric intensive care bed within North Thames/East Anglia (or appropriate alternative) for those deemed to require intensive care.
- ❑ Any child within North Thames requiring PIC can usually expect the retrieval team to be mobilised within 20 minutes from the decision to retrieve.
- ❑ Any child within East Anglia requiring PIC depending on transport mode can usually expect the retrieval team to be mobilised within 1 hour from decision to retrieve.
- ❑ Early expert clinical advice and management by Consultants trained in Intensive Care is available to referring hospitals at all times.
- ❑ The clinical team comprises of an SpR (year 3/4 training with at least one year's experience in intensive care) or ANP and a paediatric nurse with the relevant experience in PICU with the appropriate ITU qualification.
- ❑ Education and training of the CATS staff is a fundamental part of the service.
- ❑ Outreach education for referring units is provided.
- ❑ When the teams are on retrieval, it will be necessary to prioritise referrals according to clinical need.

# CATS organisational chart and team profile





**Management**

Dr Liz Jackson - Clinical Unit Chair  
Tom Smerdon - General Manager

**Director of CATS**

Dr A Petros

**CATS consultants**

Dr Daniel Lutman  
Dr "Ram" Ramnarayan  
Dr Richard Paget  
Dr Mark Peters  
Dr Paula Lister  
Dr Joe Brierley  
Dr David Inwald  
Dr Parvis Habibi  
Dr Sabeena Qureshi

**CATS Senior Nurse/Coordinator**

Eithne Polke

**Advanced Nurse Practitioners**

Lynn Shields  
Mark Clement  
Fergal O Malley

**Retrieval Nurse Specialists**

Beverly Halverson-Steele  
Ali Clayton Payne  
Rachel Higson  
Helen Fallows  
Carole Jones

**CATS Office Manager**

Mhairi Emery

**CATS Administrators**

Joan Joseph  
Taslina Heera  
Roger Mc Gee  
Marissa Willock  
Chevonne Dixon  
Juentelle Stapleton

**CATS Fellows/Registrars**

Dr Sandra Walsh  
Dr Anna Cserbak  
Dr Ariane kalweit  
Dr Nick Pratap  
Dr Nayan Shetty  
Dr Ruchi Sinha  
Dr Joanne Lumsden  
Dr Gavin Wooldridge  
Dr Elise Randle  
Dr Mauro Arrica



**CATS Rotation Nurses**

Great Ormond Street PICU

Catrin Hierl  
Alison Taberner Stokes  
Cathy Roberts  
Felicity Pateman  
Josephine Jim  
Helen Drennen  
Ana Marote  
Claire Fraser  
Sonia Dunn  
Ben Dale  
Simon Mansfield Sturgess  
Emma Whitehurst (training)  
Jason Pritchard (training)  
Nicola Pearson (training)

Great Ormond Street CCC

Jo Broadhurst  
Kaite Smith  
Polly Payne

St Mary's Hospital PICU

Debbie Lees  
Tamsin Dawson  
Louise Purcell  
Anne Dowson  
Clare Slade  
Emir Walsh

Royal Brompton PICU

Claire Buckle  
Jodie Luckie  
Vicky Nash  
Fiona McNerney  
Jill Mc Gee

**CATS/St John Ambulance**

Mr Bradleigh Sims (Commercial Transport Manager)

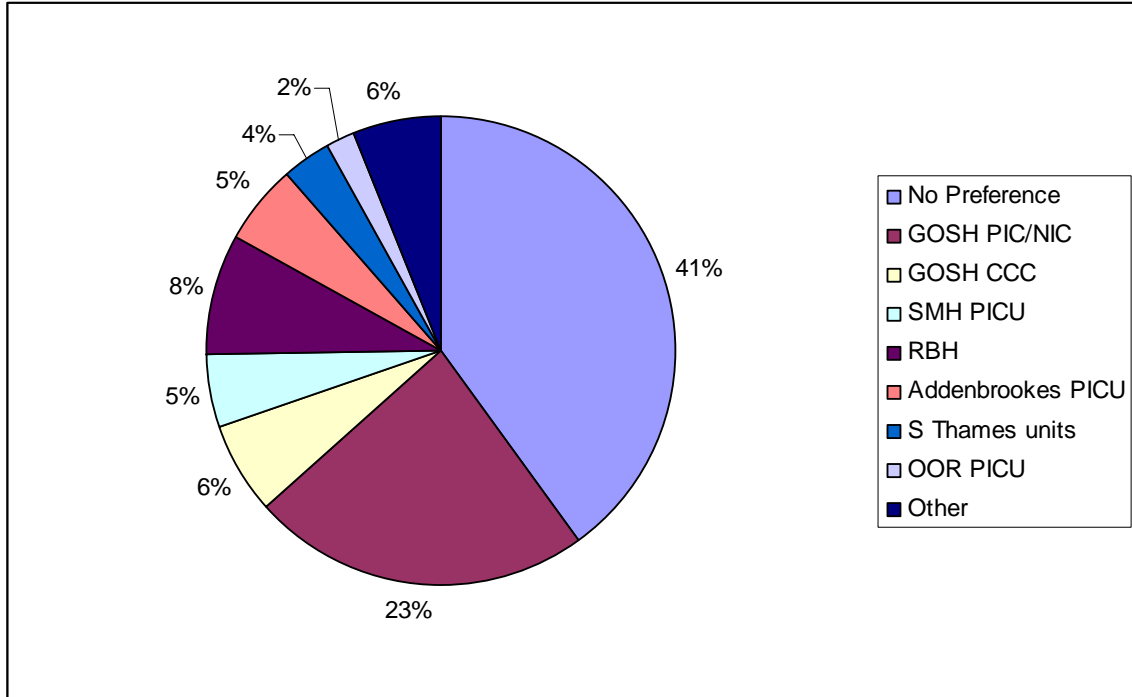
Technician Team

Richard Green  
Albert Rapicelli  
Richard Levy  
David Morton  
Paul Dunkley  
Ian Michaels  
Chris White  
Phil Bartholomew  
Maurice Johns  
Dave Warren  
Mark Warnes

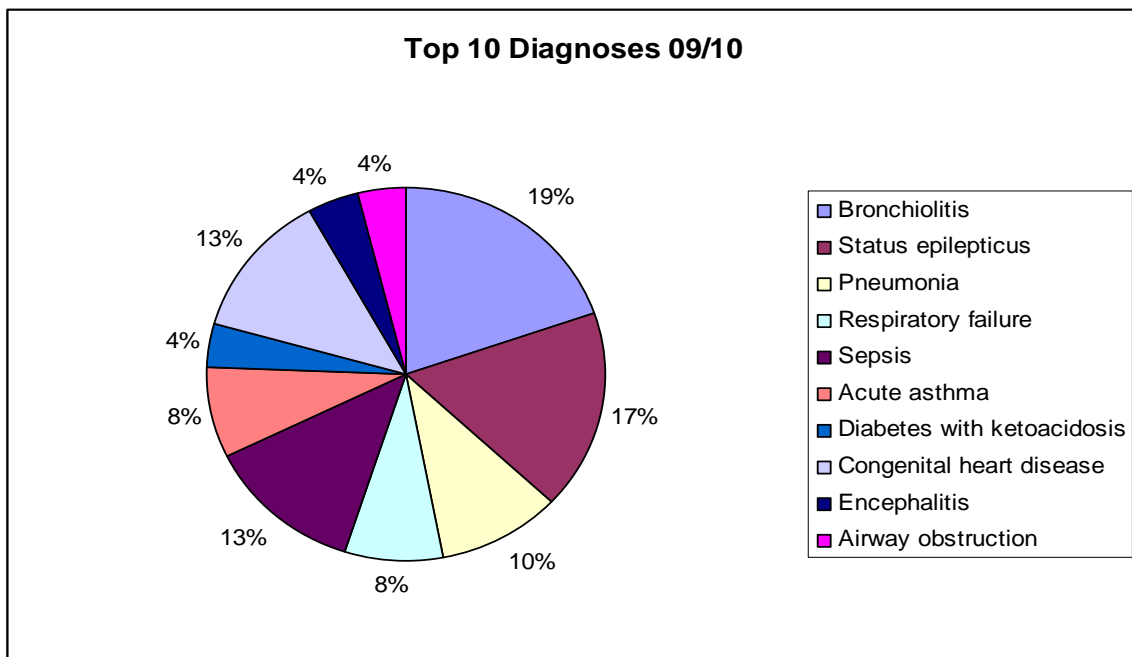
# Detailed Clinical Activity Report

## Referrals

Referrers expressed a preference for a particular unit in 59% of cases. In a significant number of referrals, no preference was expressed (41%).



Children with a number of varied conditions were referred for intensive care, reflecting the diverse case mix covered by the service.



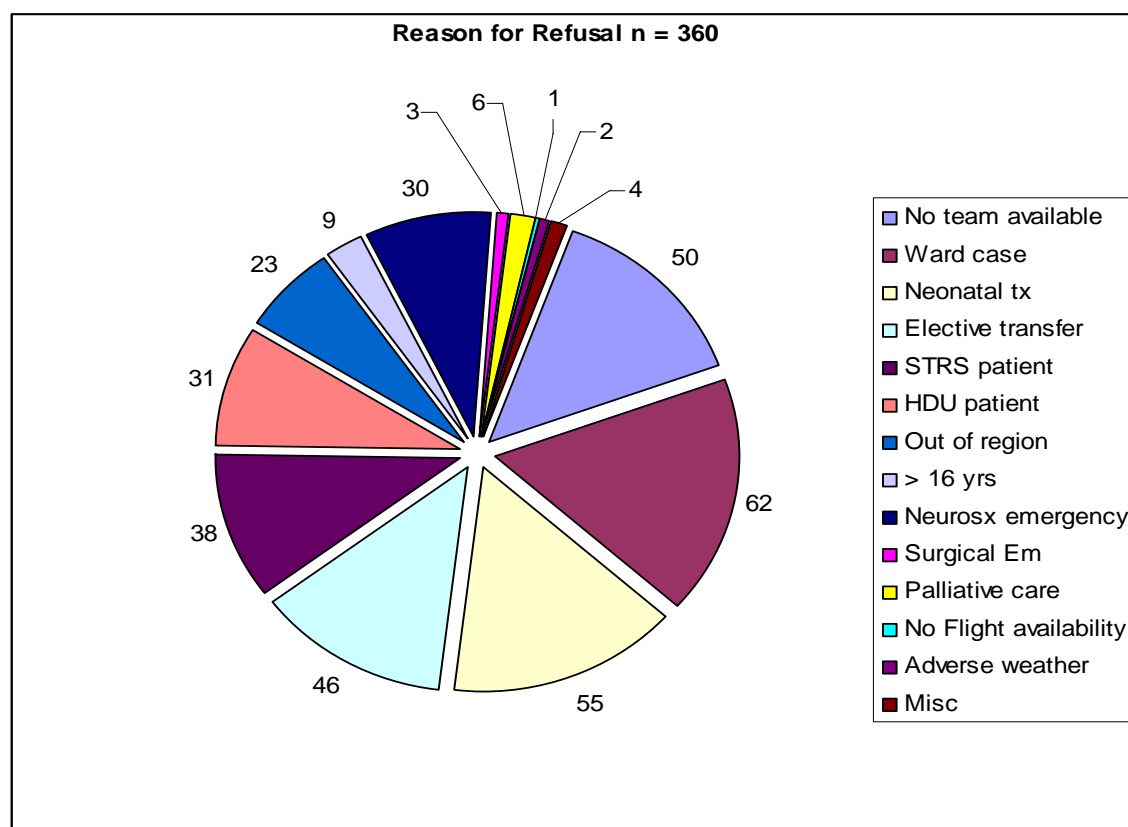
The outcome of referrals received at CATS during 2009/10 is shown below.

Outcome of referrals received (n=2080)

CATS team mobilised	1059
Resolved with advice	377
Refused	360
Cancelled by referrer	192
Death before team mobilised	16
Other	76

The reasons for refusing referrals to CATS are broken down in the following graph:

Breakdown of reasons for refusal (n=360)



### Retrievals

The CATS team was mobilised on 1059 occasions. Of these 905 children were retrieved to one of the 4 provider PICUs in North Thames/East Anglia region (154 children were transported into other destination units).

The outcome of all episodes in which a retrieval team was mobilised is illustrated in the table below:

**Outcome of all episodes in which the team was deployed (n=1059)**

Completed transfers	<b>1017</b>
Patient improved and left at referring hospital	<b>21</b>
Patient died whilst team on route to referring hospital	<b>3</b>
Patient died at referring hospital (with team)	<b>11</b>
Retrieval cancelled	<b>7</b>

The majority of patients were ventilated. A significant number needed inotrope support and a number of children needed inhaled nitric oxide during transport.

Invasive ventilation	79%
Inotrope support	30%
Inhaled nitric oxide	5.5%
Median PIM mortality risk (IQR)	9.4% (4.8 - 25)

**Destination units**

Retrievals were undertaken to a number of different PICUs. Admissions and preferences for PICUs are shown for North Thames and other regional and out-of-region units.

<b>Unit (preference)</b>	<b>GOSH</b>	<b>SMH</b>	<b>RBH</b>	<b>A'BROOKES</b>	<b>S THAMES</b>	<b>OTHER</b>
No Preference (410)	<b>176</b>	<b>135</b>	<b>22</b>	<b>27</b>	<b>38</b>	<b>12</b>
GOSH (241)	<b>184</b>	<b>23</b>	<b>4</b>	<b>6</b>	<b>14</b>	<b>10</b>
SMH (51)	<b>2</b>	<b>44</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>
RBH (86)	<b>3</b>	<b>3</b>	<b>77</b>	<b>0</b>	<b>2</b>	<b>2</b>
Addenbrookes (56)	<b>4</b>	<b>3</b>	<b>0</b>	<b>48</b>	<b>0</b>	<b>1</b>
South Thames (36)	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>31</b>	<b>0</b>
Out of region PICU (19)	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>
Other (63)	<b>27</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>

**Mode of Transport**

Most of the transfers were undertaken by road, using dedicated CATS ambulances (95%). A number of transfers were performed using helicopters or fixed-wing aircraft (5%).

## Interaction with other teams

The CATS team continues to work in close co-operation with the other regional transport services such as the London Neonatal Transport Service (NTS), the South Thames Retrievals Service (STRS) and the Anglia Neonatal Transport Service (ANTS). During busy periods, these teams cross-cover and utilise existing PICU/NICU beds efficiently.

The team interactions and their outcome are depicted below:

Referral from	Total requests	CATS team deployed	Refused due to lack of teams/Other*
South Thames Team	83 (34 bed request only)	21	9 /19*
London Neonatal Transport Service	29 (2 bed request only)	10	10/7*
Addenbrookes Team	52	29	9/14*
Oxford PICU Team	15	7	5/ 3*
Anglia Neonatal Transport Service	8	2	3/3*

\* Remainder resolved with advice or were cancelled by referring transport teams

# Clinical Governance & Quality Improvement

## CATS Risk Action Group (RAG)

The Group's aim is to ensure consistency in the quality and access to the service across the region and continue to work in partnership across the multidisciplinary paediatric critical care teams, specialised commissioners, SJA Service and where possible with patients and their carers in planning the future of CATS.

The scope of the group is to provide a forum which promotes care to the highest standard through open dialogue, teamwork and knowledge where lessons are learned and risk is minimised and where change is continuous and rapid.

The RAG membership is made up of CATS consultants, nurses, office manager, Transport manager, PICU consultants from other PICUs in North Thames and a member of the risk management team at GOSH.

- Monitor and oversee all clinical activities
- Maintain processes for assuring quality of clinical care
- Provide up to date guidelines on clinical practice and procedures
- Develop and monitor implementation of National Standards
- Monitor all research and development activities within CATS Team
- Proactively manage clinical risk assessment processes including incident reporting
- Manage complaints, critical incidents and audit
- Ensure that CATS Mortality and Morbidity meetings are held across the PICUs
- Health & Safety Standards
- Use of Information
- Education & Training Standards

All governance meetings are informed by the 3 monthly Risk Action Group meetings

- Specialty Board at GOSH
- 3 monthly clinical excellence meeting (RAG)
- 6 Monthly with the PICU provider units in order to present an audit of clinical activity and report back on critical incidents on retrieval
- Separate 6 month Morbidity & Mortality meetings (or as required) with the 4 PICUs across the region

- Monthly (3rd Friday of every month) CATS Morbidity & Mortality meetings
- Daily review of referral/retrieval activity
- Annual review of service delivery
- Outreach education packages available bi-annually to the DGH which incorporates an element of discussion on difficult cases and service improvement
- Monthly teaching programme (4<sup>th</sup> Friday of every Month)
- Extraordinary meeting which can be called by any of the users/co-opted members

### **Clinical Effectiveness**

CATS is concerned with providing evidence based guidelines on the most commonly retrieved groups of patients for both the CATS team and users of the service. We currently have all our clinical guidelines uploaded onto the CATS website for reference.

All guidelines are regularly reviewed and maintained by a multidisciplinary group and ratified with sub-speciality input where appropriate.

### **Service Improvement**

- ❑ Because of our adverse event reporting system CATS was able to identify early on the need to review our central line insertion rate and the use of intraosseous needle as our central access port for inotrope delivery. Along with NICE guidelines where the use of two-dimensional imaging ultrasound guidance should be considered in most clinical circumstances where CVC insertion is necessary either electively or in an emergency situation. This allowed us to put a successful business case forward in support of the purchase a portable “Sonosite” ultrasound device which now forms part of our kit. **(40% recorded access issues in 08-09 down to 21% in 09-10)**
- ❑ This also led to a review of our intraosseous needle kit with a move to the much easier solution. CATS now carry the EZ IO.
- ❑ Glidescopes have been purchased for use in the “difficult airway” scenario
- ❑ An audit was undertaken of central line insertion infection rates and because of



this work CATS now carry an easily accessible central line insertion pack.

- As the year progressed there was a notable increase in problems with our propaq monitors. CATS established an improved tracking system with a report requested from each repair. It also allowed CATS to set up a system with BME where spare parts of the most commonly replaced parts are kept on site
- Some indicators are audited continuously, for example the use of lights and sirens remains an ongoing project.

### **Mobilisation Times**

One of the service standards, and an accurate indicator of the agility of the service, is time to mobilise a team once the decision to accept the patient has been made. As part of our quality improvement programme the CATS team aims to mobilise a team within 20 minutes of acceptance.

In addition, the CATS team aims to provide the same level of intensive care at the referring institution as at the receiving PICU - this often necessitates a period of stabilisation and assessment of stability for transfer.

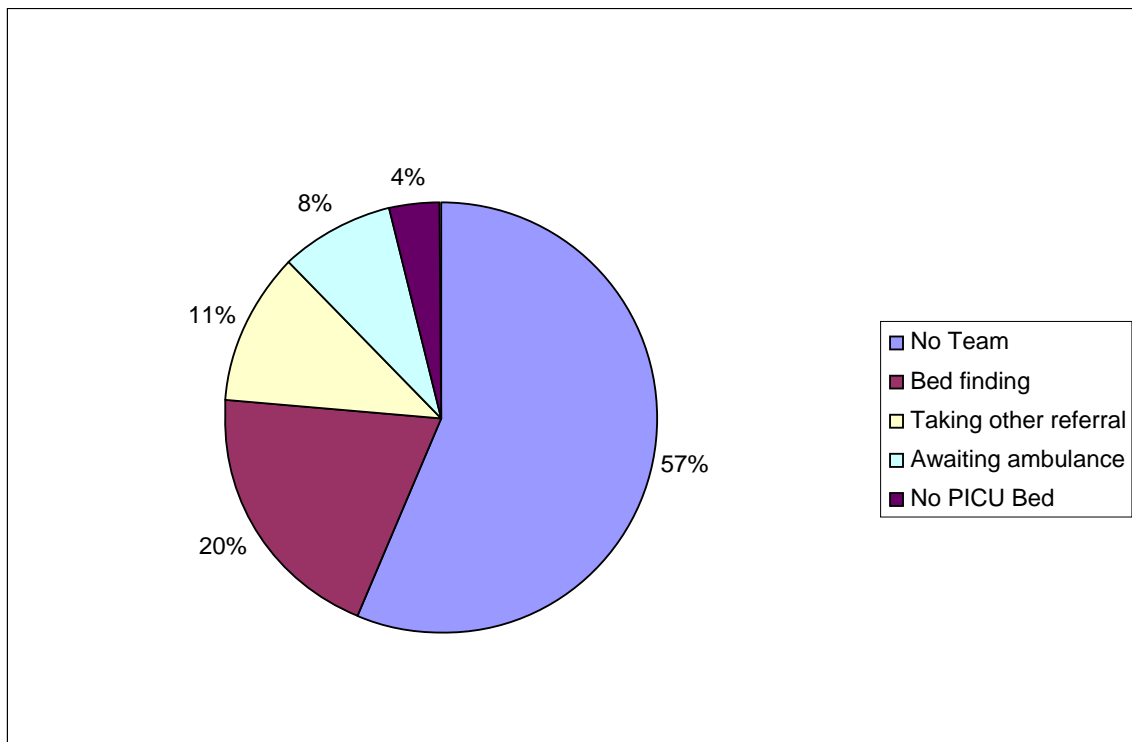
### **Mobilisation and stabilisation times**

Mobilisation time	Median 20 min (IQR 13 - 32)
Stabilisation time	Median 105 min (IQR 75 - 137 )
Total transfer time	Median 280 min (IQR 220 - 355 )

Service capacity is the main reason for the target 20 minute mobilisation time being delayed n = 204 (71%) of our total recorded delays.

The reason for not achieving our 20 minute mobilisation target are outlined below

**> 20 minute mobilisation delay: n = 287 (30.9% total transfers)**



### **Risk Management/Adverse Event Reporting**

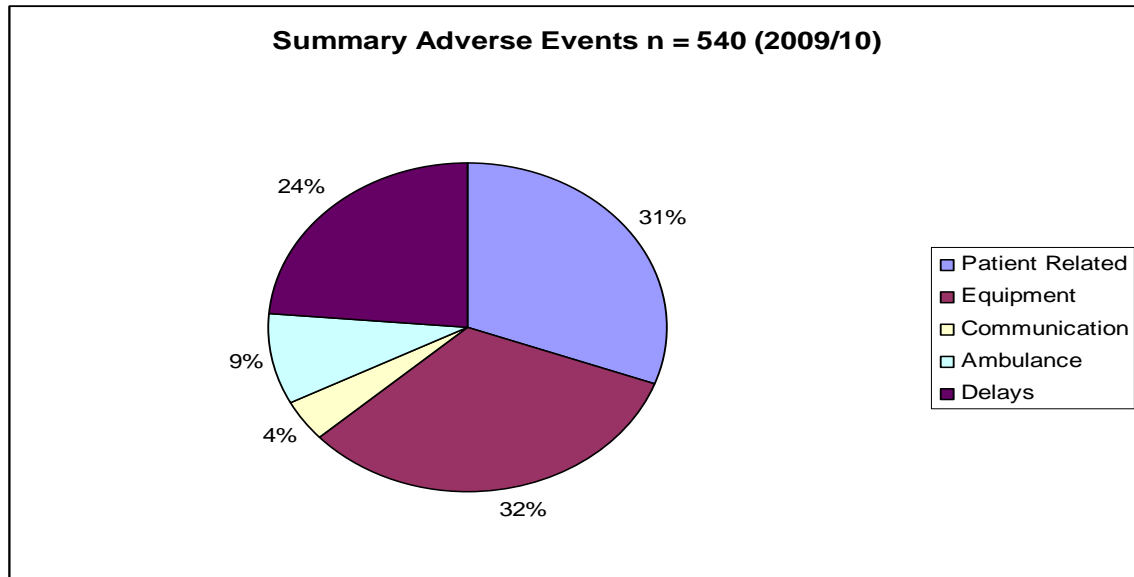
CATS has a robust clinical risk management system. The clinical team records adverse events and near misses during the course of the transfer relating to ambulance, equipment, and patient-related activity.

Adverse event reporting is encouraged to facilitate an active approach to risk reduction. Each adverse event is analysed during the daily team meeting where clinical activity from the previous 24 hours is discussed.

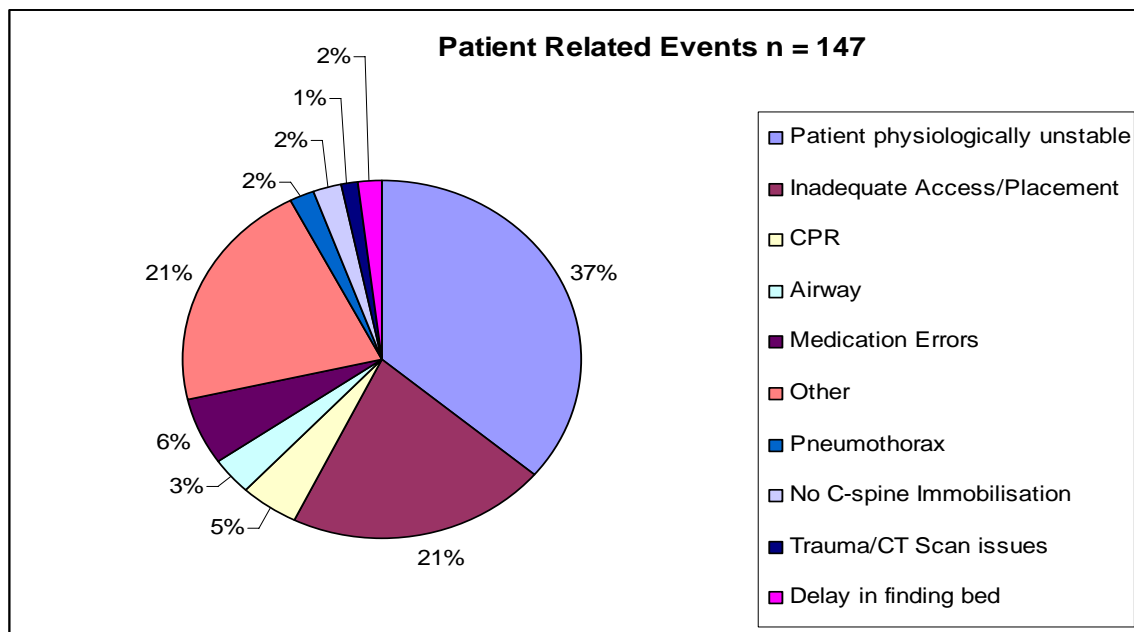
The vast majority of transports did not involve any adverse events (71%).

In 29% of retrievals, teams documented and reported adverse events - the majority were minor and did not compromise patient safety.

Events were analysed in five major groups (ambulance related, equipment related, and patient related as well as communication and delays, outlined in graph below).



**Safety:** More detailed breakdown of patient related events outlined in graph below:



### Transfers Out of Region (admissions to PICUs outside London)

This year's activity saw very few patient flows from the London region to other regional PICUs. 1048 children were admitted to London PICUs. There were only 11 children transferred out of region in 09-10 to other PICUs with available beds; the majority of these children were transferred to Addenbrookes PICU.

## **Research and Audit**

CATS advocate a strong research environment as part of its clinical service. Opportunities are provided for trainees to perform studies, audits, presentations and abstracts. A number of audit projects are registered with the Great Ormond Street Audit Department and constantly re-examined to continue the audit cycle.

### **List of Audits for 09-10**

1. Use of exemptions (lights & sirens) during retrieval
2. Adverse events occurring on transfer
3. Neurosurgical emergency transfers
4. Neonatal SVT
5. Duct dependent cardiac lesions
6. Cuffed ET tubes
7. Paediatric intubations: do we have a plan B?
8. Decision time analysis
9. Mobilisation times
10. Medical documentation audit
11. Use of Ambulance child restraints
12. Paediatric Air Retrieval: Are we monitoring safety?
13. Flight Retrieval
14. Shock reversal at DGHs

### **Research themes:**

1. Use of biomarkers in early critical illness (cardiac troponin)
2. Use of information technology in improving communication between referring hospitals, retrieval teams and intensive care units (Generic Handover Investigation [GHandI]; telemedicine; teleradiology)
3. Epidemiology of retrievals and service organisation (effect of stabilisation time on outcome; effect of source of admission on outcome)
4. Early intervention during retrievals (planned cardiac output monitoring study; use of ultrasound guided vascular access)

### **Participation in multi-centre research studies**

1. GHandI study: multicentre study of the use of technology in handover, City University
2. CATCH study: multi-centre study of standard versus heparin coated versus antibiotic coated central venous catheters, Institute of Child Health

## Recent Publications (2009/10)

- 1: Ramachandra G, Shields L, Brown K, Ramnarayan P. The challenges of prompt identification and resuscitation in children with acute fulminant myocarditis: case series and review of the literature. *J Paediatr Child Health*. 2010 Jul 7. [Epub ahead of print] PubMed PMID: 20626579.
- 2: Dehò A, Lutman D, Montgomery M, Petros A, Ramnarayan P. Emergency management of children with acute severe asthma requiring transfer to intensive care. *Emerg Med J*. 2010 Jun 17. [Epub ahead of print] PubMed PMID: 20558488.
- 3: Borrows EL, Lutman DH, Montgomery MA, Petros AJ, Ramnarayan P. Effect of patient- and team-related factors on stabilization time during pediatric intensive care transport. *Pediatr Crit Care Med*. 2010 Jul;11(4):451-6. PubMed PMID: 20453701.
- 4: Lampariello S, Clement M, Aralihond AP, Lutman D, Montgomery MA, Petros AJ, Ramnarayan P. Stabilisation of critically ill children at the district general hospital prior to intensive care retrieval: a snapshot of current practice. *Arch Dis Child*. 2010 Jun 7. [Epub ahead of print] PubMed PMID: 19666940.
- 5: Anker R, Ramnarayan P. Are you sure that's the oxygen supply? *Anaesthesia*. 2009 Jun;64(6):690-1. PubMed PMID: 19453329.
- 6: Ramnarayan P. Measuring the performance of an inter-hospital transport service. *Arch Dis Child*. 2009 Jun;94(6):414-6. Epub 2009 Jan 27. Review. PubMed PMID: 19174393.

## **Presentations & Posters**

*ESPNIC; Verona June 2009*

Lynn Shields, Advanced Nurse Practitioner

Oral Presentation “Advanced Nurse Practitioners in Retrieval - The North Thames Experience”

*ESPNIC; Verona June 2009*

Anil Krishnaiah, CATS Fellow

Prize winning abstract and Oral presentation “CVC infections are higher in patients retrieved to PICU”

*National Aero- Medical Conference; Glasgow April 2010*

Mark Clement Advanced Nurse Practitioner

Oral Presentation “Advanced Nurse Practitioner Role on Retrieval”

*Association of Anaesthetists; Winter Scientific Meeting 2010*

Dr D Lutman Consultant

Invited Speaker: 'Paediatric Trauma and Resuscitation'

*Thames Paediatric Anaesthetists Group; May 5th 2010*

Dr D Lutman

Invited Speaker: 'Sepsis'

*ESPNIC; Verona June 2009*

Poster Presentation: “Early Recognition of Acute Fulminant Myocarditis”

Shields L, Ramnarayan P.

*National Aero-Medical Transport Conference; Glasgow April 2010*

Poster Presentation: “Advanced Nurse Practitioners in Retrieval - The North Thames Experience”. Shields L., Clement M. Polke E

*Paediatric Intensive Care Society meeting; Cambridge 2009*

Poster Presentation: “Paediatric Air Retrieval Safety”

Astvad M, Polke E, Clement M, Lutman D.

# **Outreach, Education & Training**

## **Outreach, Education & Training**

CATS play a pivotal role in helping referring hospitals to manage the critically ill patient and stabilise them while waiting for the transport team. This is done through regular outreach visits to facilitate case discussions as well as lectures, workshops and tutorials on specific topics such as securing the ET tube, maintaining cervical spine immobilisation etc. Consultants as well as senior nursing staff attend these sessions.

The CATS website serves as a single point of high quality information including guidelines, prescriptions for drug infusions and parent information.

### **Outreach Activity**

Integral to the development and maintenance of the clinical network is the outreach activity performed by members of CATS. This takes a multitude of forms but revolves around the activities of the core CATS team.

The CATS teams has used the sector network to model its managed clinical networks and have made themselves known to key members of staff in the hospitals that use the service.

They are therefore easily accessible on an informal basis to bring up issues regarding the service, ask clinical questions and receive immediate feedback on children that have been retrieved.

### **Outreach sessions 2009/10**

**10** outreach days organised with the DGH teams covering over **17** of the main District General Hospital referrers to the service.

There was one North Thames regional pandemic flu planning day held at Great Ormond Street Hospital in September last year.

All three networks held separate Swine Flu study days for their multi disciplinary teams, this included the adult sector.

CATS facilitated these days along with their partner PICU teams

- The North central sector, 1 day (Whittington Hospital)
- The North Western Sector undertook 3 full days for their staff
- The North Eastern Sector, 1 day (Whipps Cross Hospital)
- Essex Region, 1 day (Southend Hospital)



The idea of these outreach days is to allow full engagement between CATS and all those who look after seriously ill children in order to fulfill some of the recommendations made in the Tanner report (2006)<sup>2</sup>. The service has made a huge effort in contacting colleagues in anaesthetics, adult ICU and accident and emergency, however, despite this it is not always possible due to time constraints placed on all departments to facilitate bi annual sessions for all the District General Hospitals.

### **Managed Clinical Networks in Relation to Training, Education & Clinical Governance**

All formal complaints go through the normal clinical risk route at Great Ormond Street Hospital. CATS actively encourage feedback in relation to the many learning points that may arise within the emergency setting.

#### **North Western Sector Network**

##### **Network leads:**

Consultant Lead Dr “Ram” Ramnarayan and Mark Clement Advanced Nurse Practitioner.

Contact Details [ramnap@gosh.nhs.uk](mailto:ramnap@gosh.nhs.uk), [clemem@gosh.nhs.uk](mailto:clemem@gosh.nhs.uk)

#### **North Central Sector Network**

##### **Network Leads:**

Consultant lead, Dr Richard Paget and Lynn Shields Advanced Nurse Practitioner

Contact Details [Pagetr1@gosh.nhs.uk](mailto:Pagetr1@gosh.nhs.uk), [Shiell@gosh.nhs.uk](mailto:Shiell@gosh.nhs.uk)

#### **North Eastern Sector & Essex Network**

##### **Network Leads:**

Consultant lead, Dr Daniel Lutman and Fergal O Malley Advanced Nurse Practitioner

Contact Details [lutmaa@gosh.nhs.uk](mailto:lutmaa@gosh.nhs.uk), [omallf@gosh.nhs.uk](mailto:omallf@gosh.nhs.uk)

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<sup>2</sup> DoH (2006). The acutely or critically sick or injured child in the district general hospital  
*A team response.*

# Education & Training

## University Based Teaching

CATS Advanced Nurse Practitioners continue to provide a lecture series at 3 universities across the region South Bank University, City University, Thames Valley University and Anglia Ruskin University.

## Training Opportunities

**Staff mandatory update days.** 4 sessions held over the financial year, in which all staff that work for the service must attend in order to continue to work on CATS. Part of their mandatory update consists of a supervised retrieval

**Staff Induction days** 4 two-day sessions attended by all new starters to CATS who then go on to work in a supervised capacity on retrieval

**Ambulance Technician** update days are also held twice a year

**Core curriculum Teaching Days** are undertaken at GOSH which compliments the modular teaching for the ICTPICM.

**Mortality & Morbidity:** A monthly M&M is undertaken at CATS on the last Friday of every month. This allows the team to review the previous month's data concentrating on specific cases and utilising the discussion generated to inform practice future practice

**Daily Morning Review/Teaching:** Every morning CATS reviews its previous 24 hours work with a focus on encouraging clinical problem based discussions.

**Weekly Teaching:** A timetable is in place for all staff to participate in presenting an interesting paper, review a guideline, or present an interesting case in which they have participated in the retrieval process

**Supervised Retrievals:** The retrieval team is currently composed of one PICU doctor/ANP and one retrieval nurse. On many occasions additional nursing and medical staff formed part of the retrieval team as a training requirement or to re-evaluate a member of the team.

**Consultant Delivered Retrievals:** A consultant formed part of the team on 15% of occasions. The consultant activity relates to training and education of the retrieval fellows as well as level 4 PICU patients who require flight retrieval.

**Observer shifts:** There were also several retrievals in which an observer from the referring institutions such as the PICU outreach facilitators, registrars, and consultants were accommodated at the CATS base. They spent anything from a day to a week observing the whole referral/retrieval process and were given the opportunity to accompany the retrieval team on a number of retrievals.

**PICU Nurse Trainees:** CATS also offered placements to post registration nurses who were undergoing their PICU course at GOSH/SMH.

**Workshop/HDU meeting for stakeholders in North Thames**

A Meeting was held on 4<sup>th</sup> September 2009

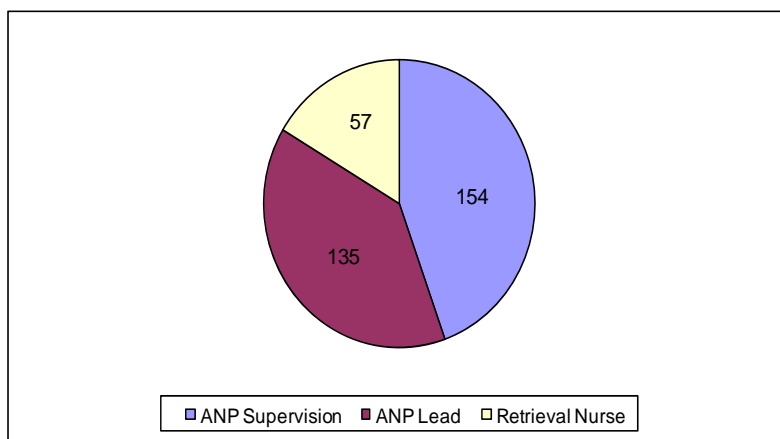
**Advanced Nurse Practitioner Programme Update**

The aim of the advanced nursing posts is to create a flexible team that can respond to the needs of the service and the referring centres through education, outreach, stabilisation and transportation of the critically ill child.

Currently all 3 of the Advanced Nurse Practitioners for the Children's Acute Transport Service have completed their training and are performing within their role. The advanced Nurse Practitioners have participated in 246 retrievals of which 135 were ANP led. The ANP job plan is divided up into 65% clinical, 25% education & training and 15% research & audit.

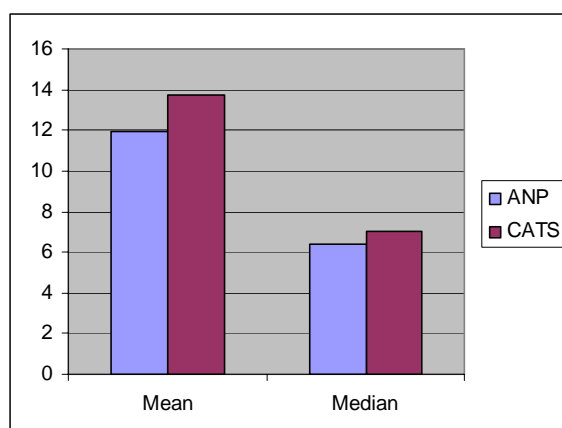
In relation to their clinical activity the following graph details their commitment to service delivery.

**Participated in 246 Transfers (23% total activity)**



**Patient Acuity**

The following graph shows a comparison of both CATS/ANP PIM range. ANP PiM: Range: 1.4 - 68, CATS overall range: 0.16 - 99.6



# Information Technology and Use of Information at CATS

A number of innovative IT developments are being piloted at CATS to improve patient care and the efficiency of the service.

## GHandI project:

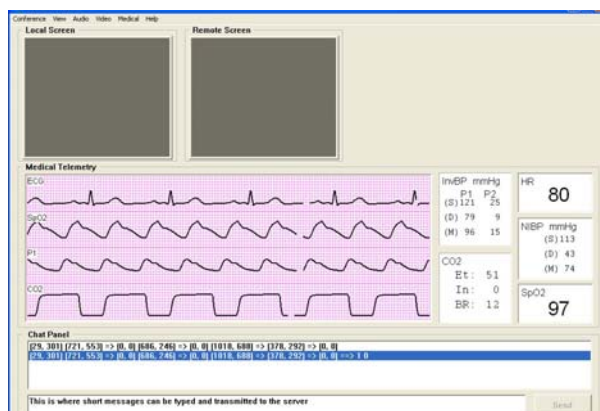
CATS worked with City University as part of a multi-centre research study on the use of technology in handover in 2009. As part of the study, GHandI researchers piloted the use of a digital ink forms technology at CATS. The CATS referral and retrieval forms were formatted and printed using digital paper technology and digital pens were used to write on the forms. The information was made available in real time to the CATS base as well as to GOSH PICU and CICU, so that receiving PICUs could easily find out what stage the retrieval was at, as well as prepare in advance for the patient's arrival. Based on the results of the research study, CATS is planning to implement the digital ink technology as part of the service later in 2010.

## CATS retrieval database

A new web-based database was implemented to capture data related to referrals and retrievals for CATS in April 2009. This followed a long design period in 2008-09 to set out the requirements of the database including detailed reporting requirements. As a result, CATS are able to audit our activity much more closely and run quality improvement projects on a continuous basis.

## Telemedicine

CATS are piloting novel technology to remotely monitor patient vital signs on retrieval. Following extensive testing, CATS may adopt this technology for use.



### **PICANet retrieval dataset**

CATS have contributed to the development of the national dataset for retrievals that PICANet are implementing later this year. In addition, CATS piloted the data collection forms and provided useful feedback to PICANet.

# **International Peer Review: Commission on Accreditation of Medical Transport Systems (CAMTS)**

## **Accreditation process**

The uniqueness of the CATS service makes quality benchmarking difficult. In 2008 it was agreed an external international peer review would be of great value in identifying areas of high quality and identifying aspects of the service that could be improved.

This review with its recommendations would allow the team, if required, to refocus and prioritise thereby ensuring the service was achieving the highest possible standards.

The US based 'CAMTS' organisation has been developing standards and assessing medical transport systems for 19 years. Given this wealth of experience they were selected to provide a 'ground up' assessment of the CATS service in a process that has taken two years to complete. A programme information form (PIF) was submitted to CAMTS. This programme information form (PIF) questionnaire outlined the service as it stands under the following headings

## **General programme information in relation to:**

- Personnel
- Education & training
- Road/air transport activity history
- Overall referral/retrieval activity
- Case mix
- Accident rate/history and vehicles involved.

Once the service had been accepted by CAMTS for review a 160 page assessment form was completed supported by 135 folders of documentary evidence which were then processed by two CAMTS site surveyors.

The evidence considered included information on our mission statement and scope of care, ground transport policies and documents, rotary wing policies and documents, fixed wing policies and documents, general standards in relation to staff and staff training, this included evidence of education specific to the air medical in-flight and ground transport environment as well as specific policies regarding aircraft/ambulance operations and evidence of training in specific areas such as communication/communication equipment and survival training.

The PIF scrutinised the safety management systems ensuring that CATS safety management system appropriately identified risks in order to eliminate injuries to personnel and patients and damage to equipment.

The second phase involved a three day site survey by the CAMTS site surveyors. The site visit included interviews with a cross section of all the team members, ensuring that the information we presented to them via the PIF matched the staff responses and expectations of service delivery.

They also scrutinised hard copies of all of our guidelines/protocols/policies.

They examined all aspects of our vehicles, including site visits to aircraft providers 'CEGA' and the Royal Air Force. The CAMTS surveyors visit even included surprise visits to the aircraft maintenance engineers to check individual tool calibration records and audit processes.

In January 2010 the site surveyors presented their findings to the CAMTS board. The CAMTS board decision was to award CATS full accreditation for Critical Care for rotor wing, fixed wing and ground transports. CATS is the only service in Europe to have achieved an international accreditation from CAMTS.



### **External consultations and representation on expert working groups**

The CATS coordinator has been invited to assist the Republic of Ireland Health Service Executive in the implementation of their national retrieval service.

Daniel Lutman, CATS consultant has contributed to the Paediatric Intensive Care Society (PICS) Standards; this project is now complete and the revised standards have been published.

He has also been a member of the London Ambulance Service Medical Steering Group as an expert adviser for paediatrics.

Dr Ramnarayan, CATS consultant is a member of the Department of Health sponsored Acute and Critical Care Information Advisory Group and represents PICS at the group. He is also lead for the Transport Study Group at PICS SG and the lead for the Informatics Group of the PICS.

## **Parent and Public involvement**

### **Parents in Transport**

To overcome many of the risk management issues that existed CATS built their intensive care ambulances specifically to be able to accommodate one if not both parents.

Last year all parents were offered the opportunity to travel with their critically ill child. In 2009/10, there were no adverse incidents associated with a parent travelling with the team and no parent was prevented from travelling if they wished to do so.

### **Children's Emergency**

CATS were filmed for an on the road documentary series (8 X 30 minute programmes) which was aired on BBC1 this spring.

*"Children's Emergency"* programme profiled the Children's Acute Transport Service, which is seen as a unique service designed to take the skills and high-tech equipment of a paediatric intensive care unit 'on the road'.

The series followed the team as they travelled by road, plane or helicopter to stabilise and safely transfer young patients to specialist hospitals including the world-renowned Great Ormond Street Hospital for Children, St Mary's Hospital and Royal Brompton Hospital in London.

## **Work In Progress for 2010/2011**

A number of projects are underway at CATS for the year 2010/11.

- Expand the outreach education programme to all referring units, especially by remote means.
- Looking at ways to improve the uptake of outreach education to the DGH
- Written protocols and guidelines for the management of all patient illness groups updated as per best practice or every 2 years.
- Advanced Nurse Practitioner role development remains a priority to the service with a drive to increase the numbers from three to six team members.
- The re-establishment of HDU study days for the multi disciplinary team within the DGH setting is a priority for CATS
- Continue to work collaboratively across the region as well as nationally with other transport services
- Improving the two-way feedback system for referrer and receiving PICUs
- Continue to lead the way for research in transport medicine and set up collaborative studies with other transport services