

# National Surveillance System for Dialysis Centre and Dialysis Associated Diseases

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# Vascular access pathway

Detection

Nephrological  
assessment

Surgical pathway

Maintenance and care



# UK RA Vascular Access Survey 2005

- Census of all dialysis patients
  - 62 centres returned
  - 4 unable to assist
  - 6 no return
- Census of chronic HD patients in hospital
- Proportion of above due to vascular access
- 2004 *Staph. aureus* septicaemias in chronic HD patients
- Proportion of those due to MRSA

# UKRR 2005 Report

- 54 centres returned data
- 1547 episodes of *Staph. aureus* bacteraemias reported
- 462 episodes of MRSA (29%)
- Equivalent to 5-10% of all MRSA (relative risk 200-400 fold general population)

# Incident data

- 457 new RRT (ESRF) patients in April 2005
- 62 centres reported

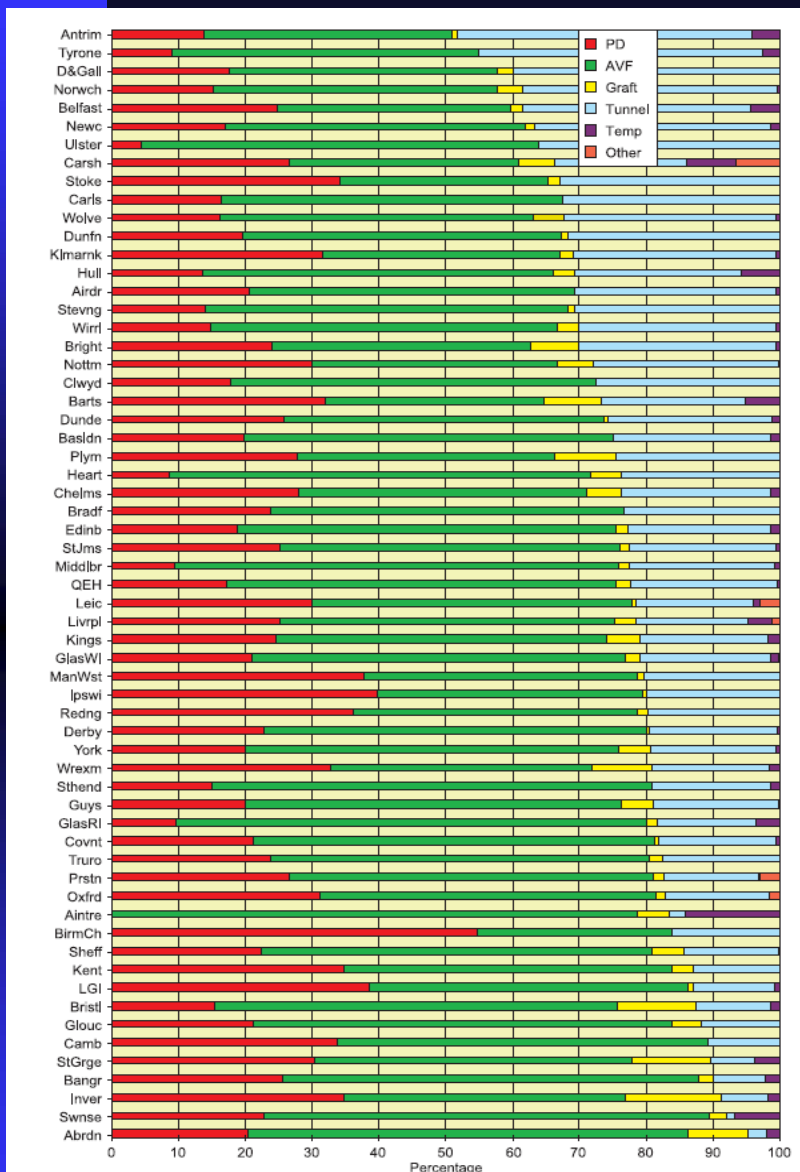
Modality	Frequency	Percent
HD	351	77
PD	86	19
Transplant	17	4
Missing data = 3		

**Table 6.8: Incident HD patients: Access**

Access type	Frequency	Percent
Total HD	351	
AVF	104	30
AV Graft	6	2
Non tunnel	126	36
Tunnel	115	33

## Preparation: Time since 1<sup>st</sup> contact and 1<sup>st</sup> Rx (HD only)

Time	AVF	AVG	NTC	TC	% C
<3	6	1	65	36	94
3-6	4	0	5	9	78
6-9	8	0	3	10	62
9-12	2	0	3	7	83
12-24	22	1	13	10	50
>24	58	4	25	36	50
Total	100	6	114	108	68
N=328					



- Overall 13,343 (77%) of prevalent patients were having dialysis therapy delivered by definitive access.
- Centres varied from 52% to 95%.
- For HD patients only, definitive access was used in 69%, range from 44% to 94%.

# Lessons

## Timely

- Recognition and preparation
- Late referral

## Process

- Achieving definitive access

## Consistency

- Variability across UK
- Morbidity

## Audit and data

- Audit standards
- Data collection



Concerns about infection – using MRSA as a tool


# SETTING UP A NATIONAL SYSTEM


# Methods

- MRSA bacteraemia reporting mandatory in England since 2001
  - Healthcare Associated Infection Data Capture System (HCAI-DCS) (previously called Mandatory Enhanced Surveillance System, MESS)
- Working party formed to extend reporting in ERF
- Pilot project 2006-7
- Project went live in April 2007

# Health Protection Agency: MESS

**Mrsa Data Capture System**




cases duplicates reports logoff

ID:  Date entered:  Main Screen Save Cancel

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**Source of bacteraemia** Other:  Certainty:  **Associated clinical infection** Other:  Certainty:

**Risk factors for bacteraemia**

Peripheral IV device:  Central IV device:  Surgical wound:  Assisted ventilation: Current  Past 7 days  Urinary catheter:

Liver disease:  Prosthesis:  IV drug user:  Immunosuppressed:  Diabetic:

Prior S.aureus history:  If YES when:  Other:

**Treatment of bacteraemia**

Remove IV device:  Remove catheter:  Drain wound:  Surgery:  Antibiotic therapy:  Other:

**Renal care parameters**

Modality:  HD/HDF access type:  Catheter last 28/7:  If "Yes", worst type:

**Health**

# Process of reporting

MRSA Bacteraemia diagnosed

```
graph TD; A[MRSA Bacteraemia diagnosed] --> B[MESS system completed and record 'shared']; B --> C[Renal unit designated lead informed by email alert]; C --> D[Renal record completed by renal centre];
```

MESS system completed and record 'shared'

Renal unit designated lead informed by email alert

Renal record completed by renal centre

# Extended renal data items

**Table 12.1.** Data captured in the HCAI-DCS

Data item	Options
Main renal centre responsible for ongoing care	List of all main renal centres
Dialysis centre where the patient receives haemodialysis	List of all dialysis centres affiliated to the main renal centre
Modality of dialysis	Unknown/haemodialysis/haemodiafiltration/peritoneal
Type of access being used	Not applicable/unknown/AVF-simple/AVF-complex/AVG/tunnelled venous catheter J or SC/tunnelled venous catheter – femoral or other/non-tunnelled venous catheter J or SC/non-tunnelled venous catheter – femoral or other
Catheter used in the preceding 28 days	Unknown/yes/no If yes, what type? (Unknown/tunnelled venous catheter J or SC/tunnelled venous catheter – femoral or other/non-tunnelled venous catheter J or SC/non-tunnelled venous catheter – femoral or other)

# Results:

## Risk:

100 fold higher incidence than general population

800 fold higher incidence for those using a venous catheter

No episodes reported in PD population

**Table 12.3.** Modality of dialysis in patients in established renal failure where record shared and completed

Modality of dialysis	MRSA bacteraemia	
	N	(%)
Haemofiltration	3	(3.3)
Haemodialysis	87	(94.6)
Unknown	2	(2.2)
All	92	(100)

Renal access type	MRSA bacteraemia	
	N	(%)
AV – simple	23	(25.0)
AVG	4	(4.4)
Non-tunnelled – femoral	6	(6.5)
Non-tunnelled – jugular or subclavian	4	(4.4)
Tunnelled – femoral	5	(5.4)
Tunnelled – jugular or subclavian	50	(54.3)
All	92	

196 records – including 8 duplicates  
188/4448 related to ERF (4.2%)

49% shared and completed (n=92)  
15% not shared (n=29)  
36% shared but not completed (n=67%)

# Acute Trusts reporting ERF associated MRSA bacteraemia

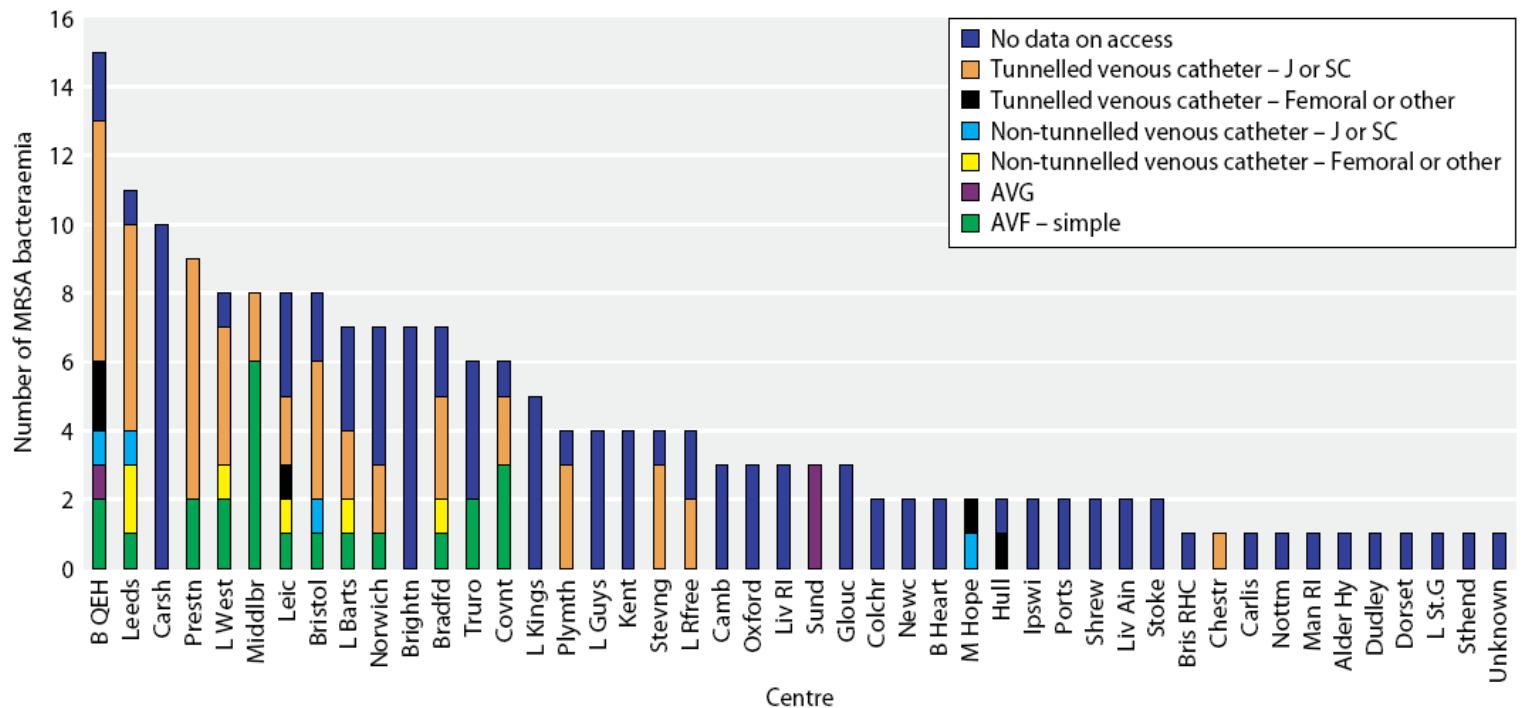


Fig. 12.2. Number of MRSA bacteraemia by access type and renal centre in reporting NHS Trusts (all records N = 188)

# Episodes by Renal centre (shared records only)

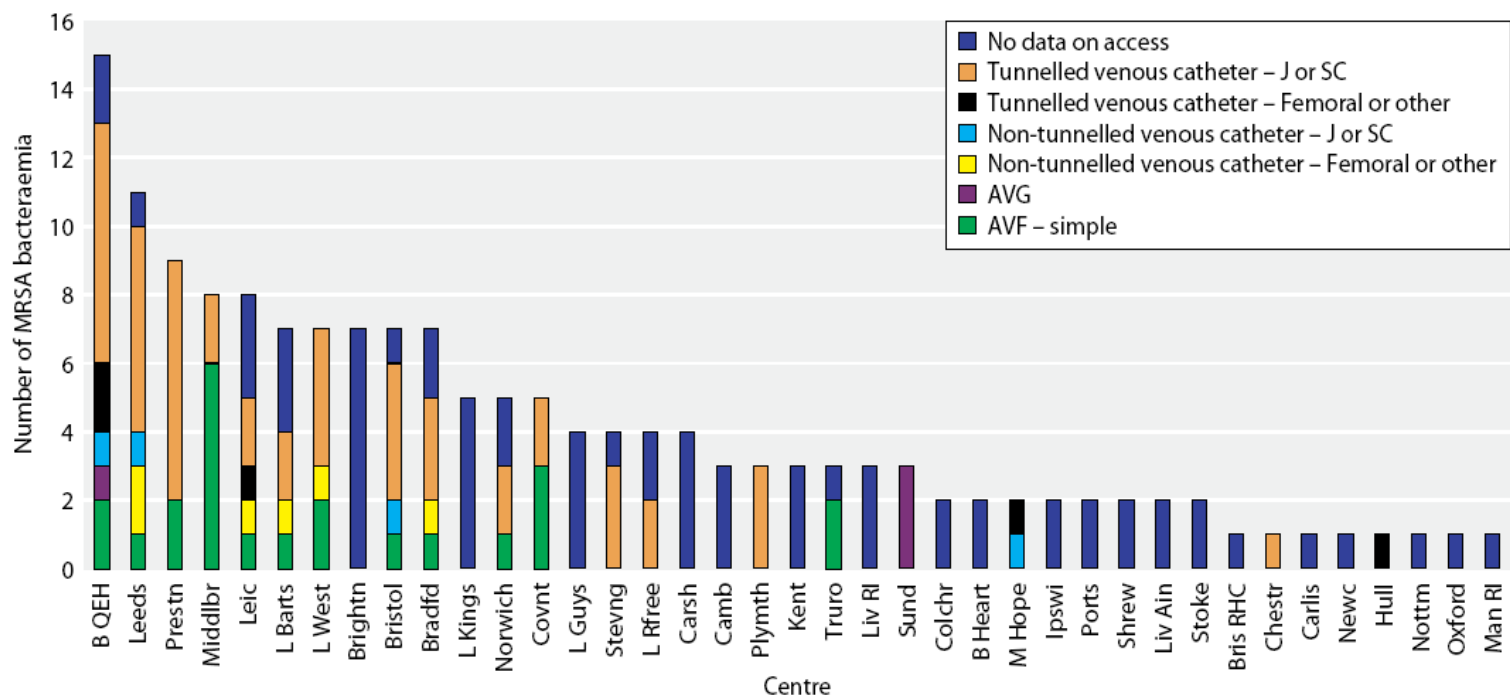
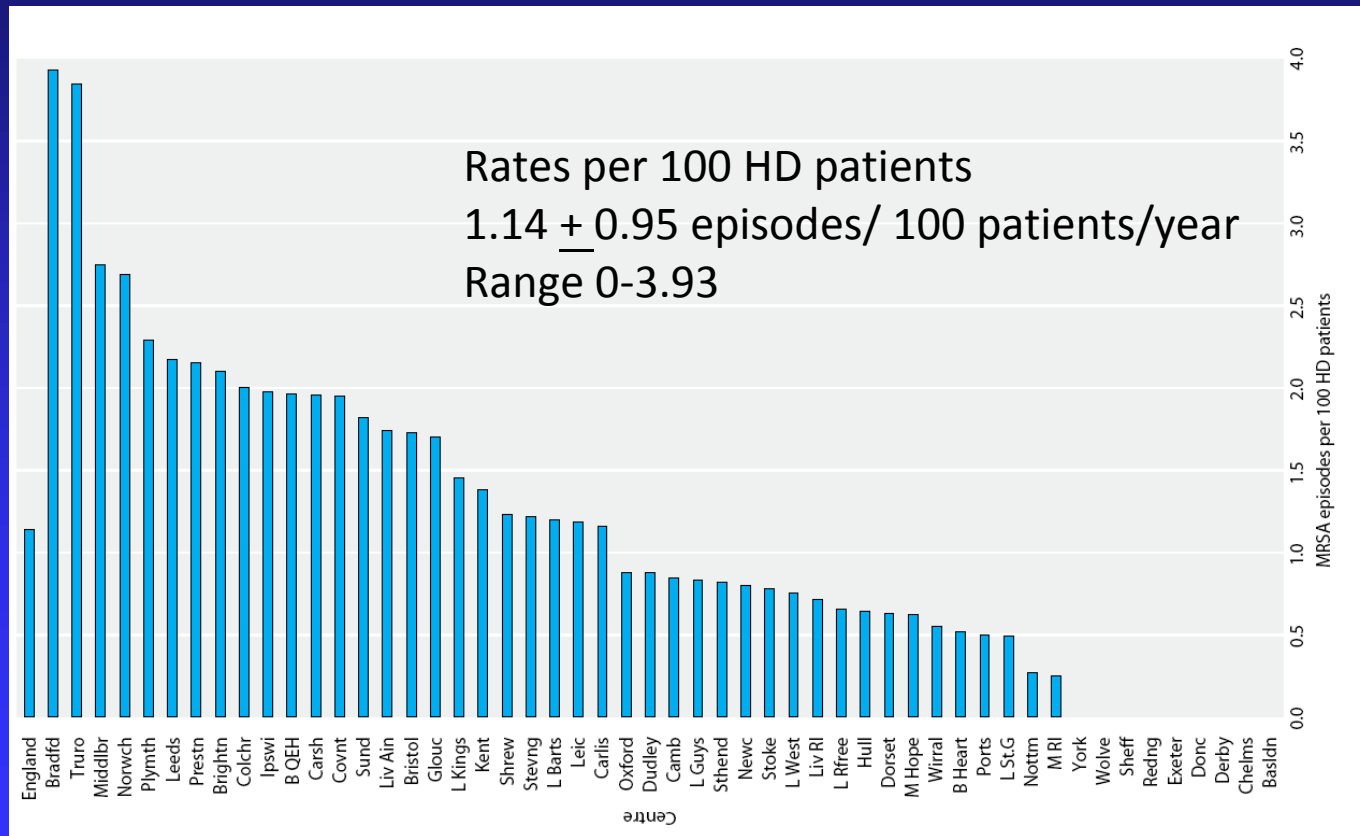


Fig. 12.3. Number of MRSA bacteraemia by renal access type and renal centre (shared records only) N = 159



# MRSA in the dialysis population

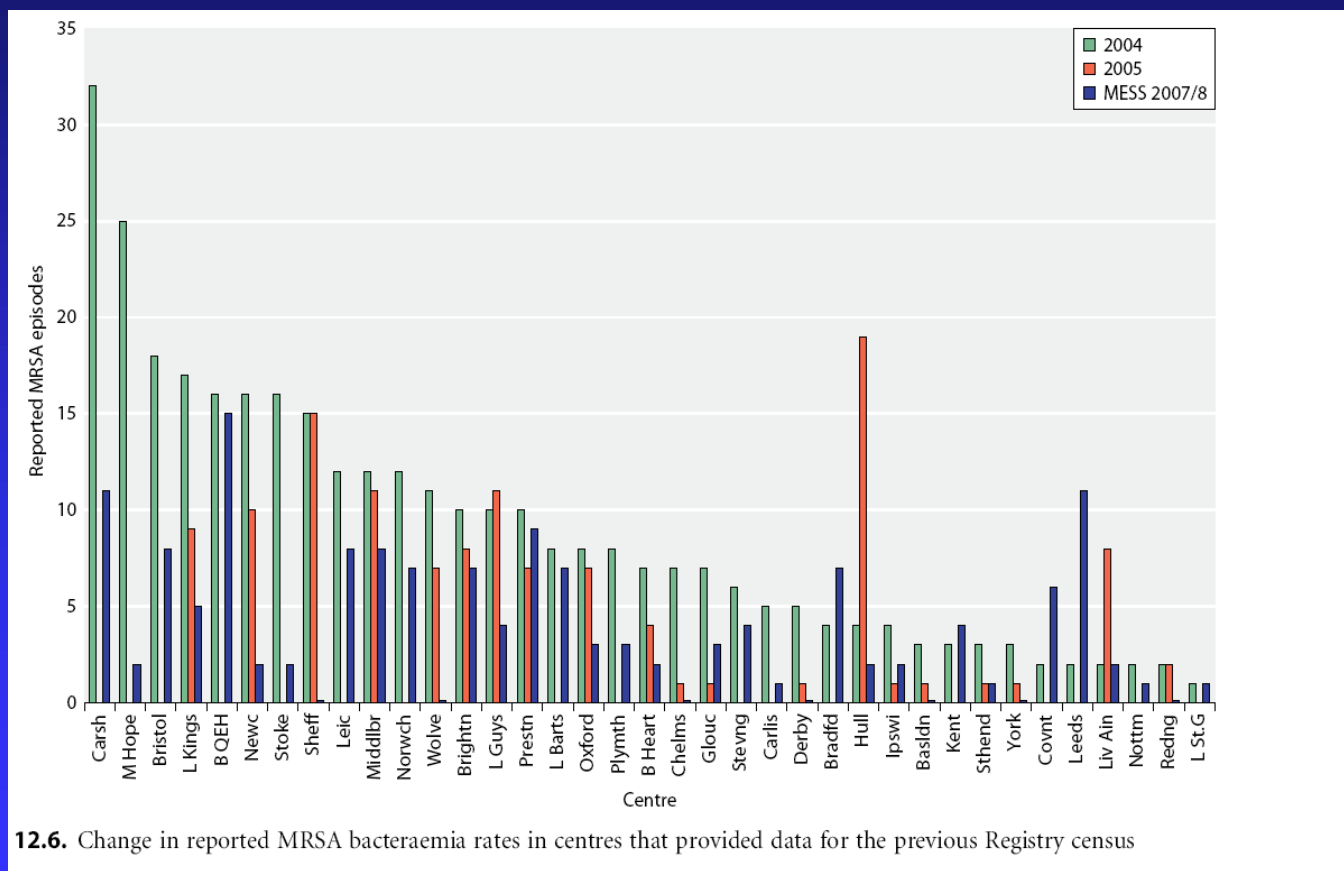
Variation (note no confidence intervals)



Data taken from **Epidemiology of Methicillin Resistant Staphylococcus aureus bacteraemia amongst patients receiving Renal Replacement Therapy in England in 2007: a joint report from the UK Renal Registry and the Health Protection Agency (The Eleventh Renal Registry Report)**, Nephron Clinical Practice, 2009

# MRSA in the dialysis population

## Comparison with previous Registry reports

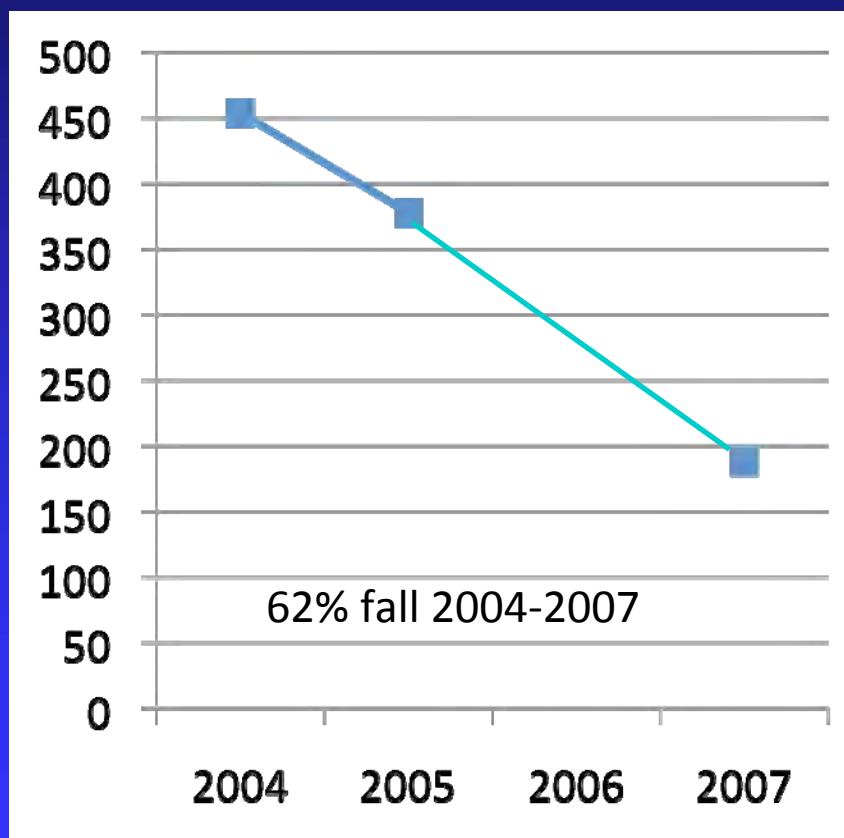


12.6. Change in reported MRSA bacteraemia rates in centres that provided data for the previous Registry census

Data taken from **Epidemiology of Methicillin Resistant Staphylococcus aureus bacteraemia amongst patients receiving Renal Replacement Therapy in England in 2007: a joint report from the UK Renal Registry and the Health Protection Agency (The Eleventh Renal Registry Report)**, Nephron Clinical Practice, 2009

# MRSA in the dialysis population

Improving in England – learning from each other



Data taken from **Epidemiology of Methicillin Resistant Staphylococcus aureus bacteraemia amongst patients receiving Renal Replacement Therapy in England in 2007: a joint report from the UK Renal Registry and the Health Protection Agency (The Eleventh Renal Registry Report)**, Nephron Clinical Practice, 2009

# MRSA in the dialysis population

Risk: 100 fold higher incidence than general population

800 fold higher incidence for those using a venous catheter

## Variability by centre England



## Improvement across England Episodes year

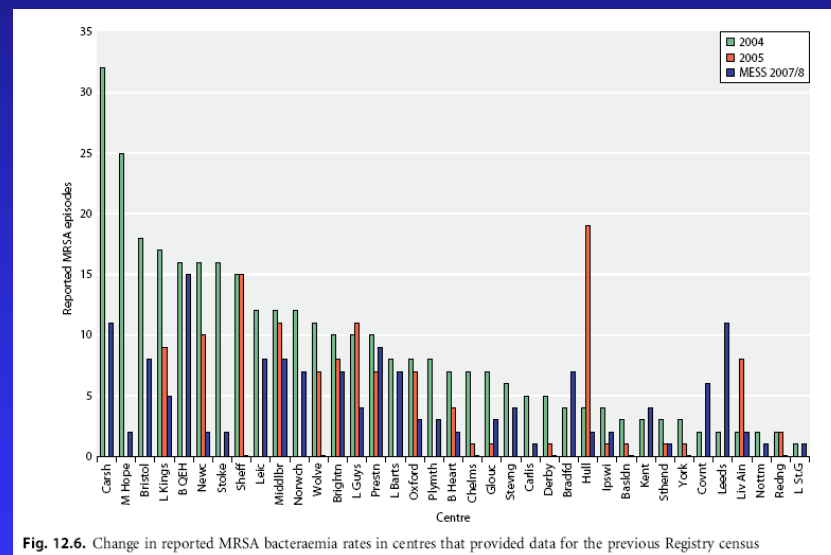


Fig. 12.6. Change in reported MRSA bacteraemia rates in centres that provided data for the previous Registry census

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# MRSA in the dialysis population

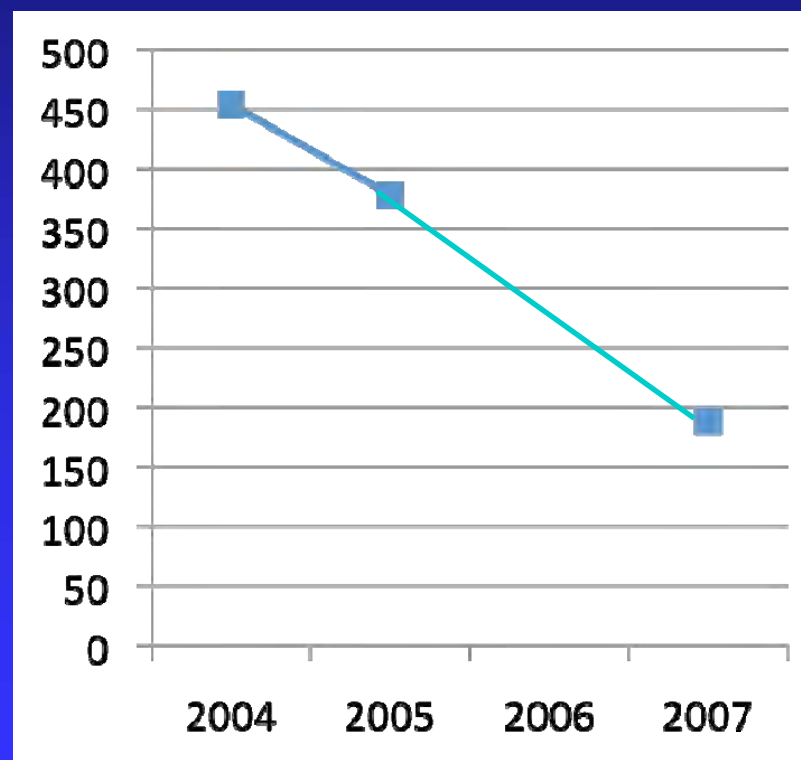
Improving in England – learning from each other

## Variability by centre England



## Improvement across England Episodes/ year

62% fall 2004-2007



Data taken from **Epidemiology of Methicillin Resistant Staphylococcus aureus bacteraemia amongst patients receiving Renal Replacement Therapy in England in 2007: a joint report from the UK Renal Registry and the Health Protection Agency (The Eleventh Renal Registry Report)**, Nephron Clinical Practice, 2009,

# Year 2007/8

- Patients requiring dialysis for ERF in England contribute 4.2% of MRSA bacteraemia
- The risk for a dialysis patient is 100 fold higher, but higher if utilising a venous catheter
- Rates have fallen in England

**YEAR 2008/9 – SECOND YEAR  
OF REPORTING**

# Record completion 08/09

		n	%	Total
<b>Rejected</b>	Shared & completed	2	1.2	18
	Shared, not completed	6	3.5	
	Not shared	10	5.8	
<b>Accepted</b>	Shared & completed	40	23.4	153
	Shared, not completed	63	36.8	
	Not shared	50	29.2	
	<b>Total</b>	<b>171</b>		

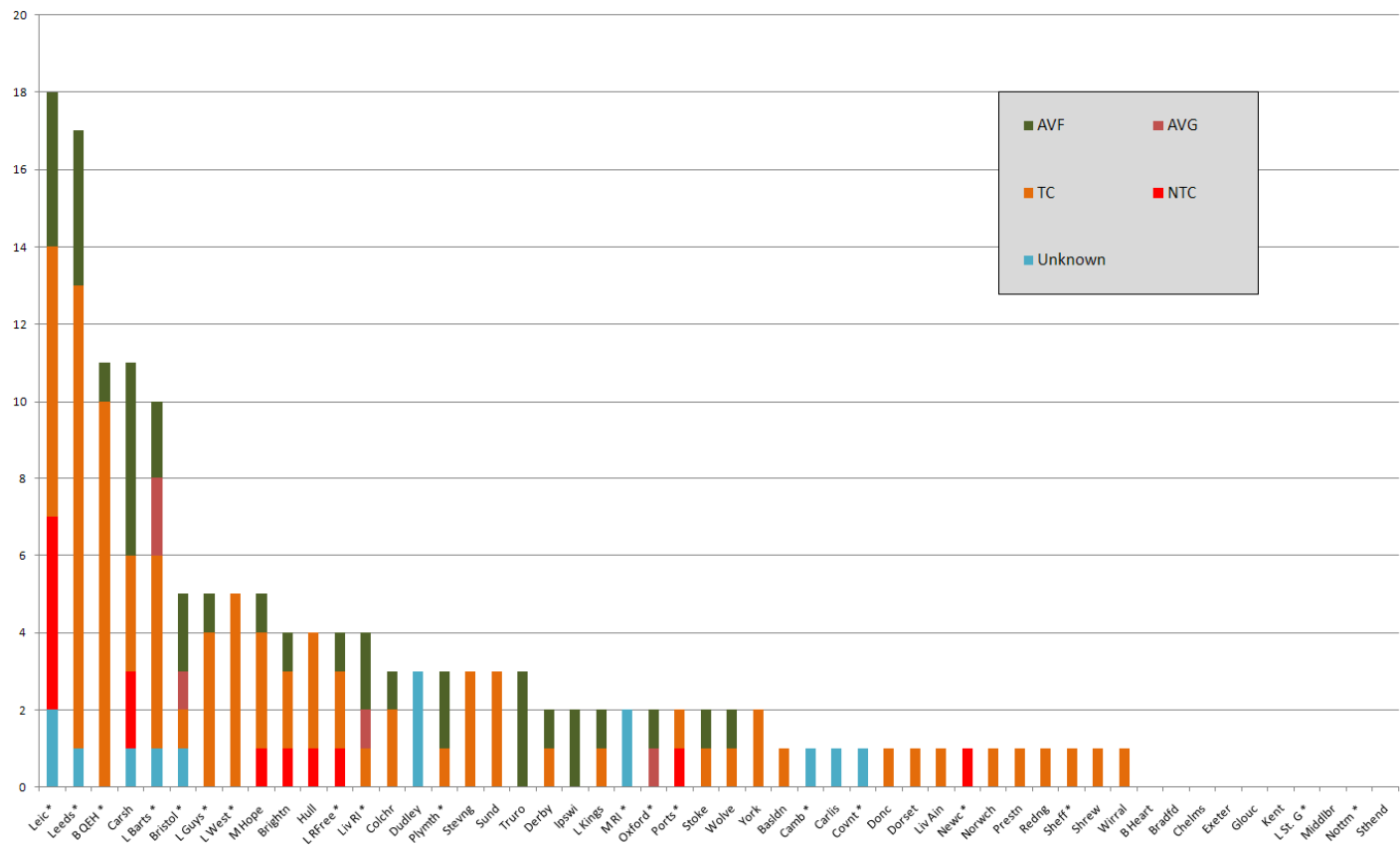


# Access and recurrence MRSA

	n	%	Access class	
<b>Unknown Haemodialysis</b>		9		
	Other	1		
	AVF	37	26.6	30.2
	AVG	5	3.6	
	NTC	13	9.4	69.8
	TC	84	60.4	
	Unknown	4		
<b>Total</b>	<b>153</b>			
<b>Total known access</b>	<b>139</b>			

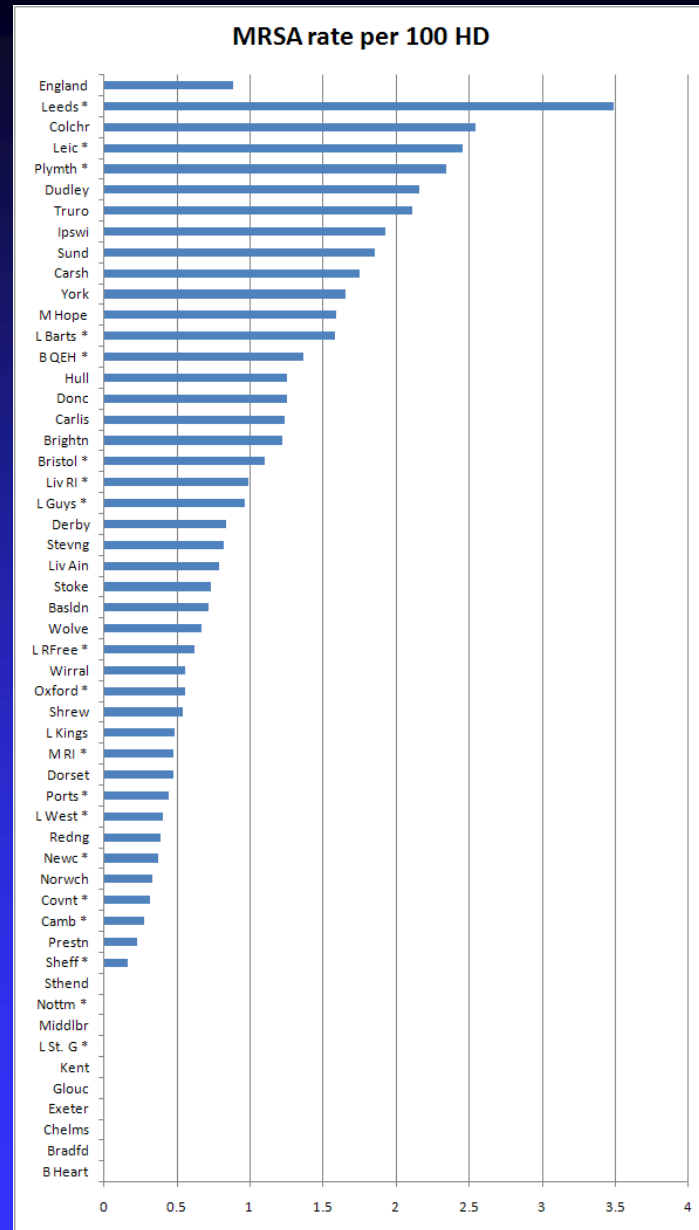
Episodes per patient	n	Total
1	123	123
2	5	10
3	4	12
4	2	8
<b>Total</b>	<b>134</b>	<b>153</b>

# Episodes and access by centre

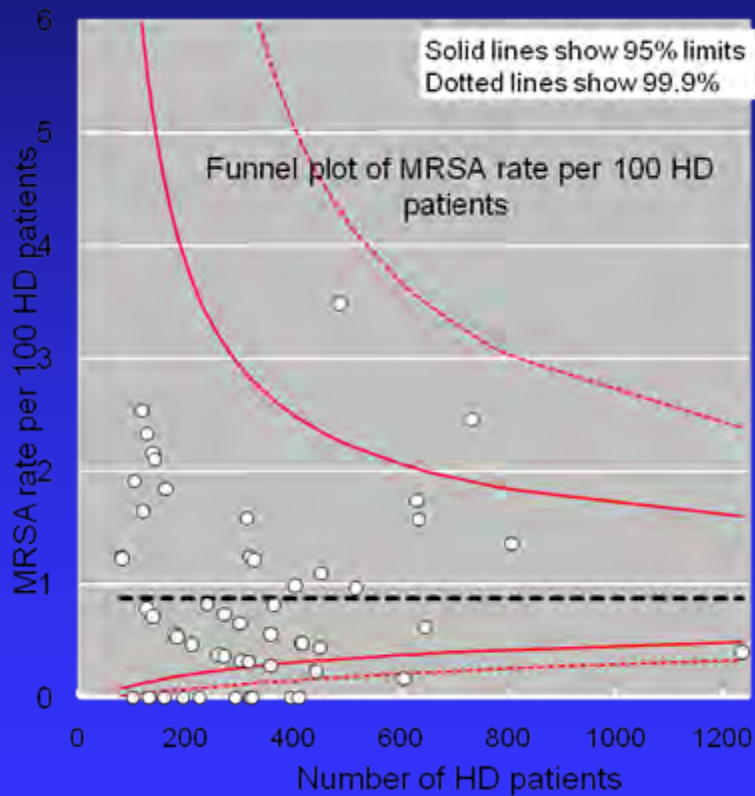


# Corrected rate per 100 HD patients

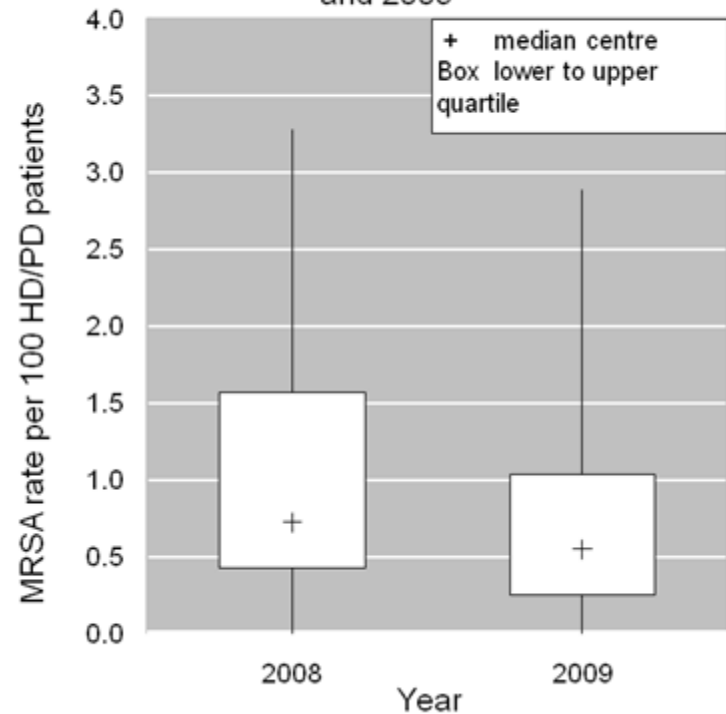
Further fall to 159 episodes



# Year 2008/9




Box and whisker plot of MRSA rates by centre per 100 HD/PD patients for 2008 and 2009



Next steps

# **DEVELOPING AND ENHANCING THE SYSTEM**



**Quality information for frontline services**

National Kidney Care Audit  
Vascular Access

# The National Kidney Care Audit

Run by The NHS Information Centre in partnership with:



Covers all haemodialysis patients in renal and satellite units

Measuring two key areas:

- Vascular access
- Patient transport



# Background & Scope

- Healthcare Quality Improvement Partnership (HQIP) commissioned audit and awarded contract to NHS IC - early 2008
- Measuring two key areas:
  - **Patient Transport** (*Results now available*)
    - Survey of patients (paper questionnaires)
    - Survey of unit managers and commissioners (online questionnaire)
  - **Vascular Access**
    - Extract of electronic data from the UK Renal Registry, and HES, HPA (and equivalents in other countries)



# Vascular Access

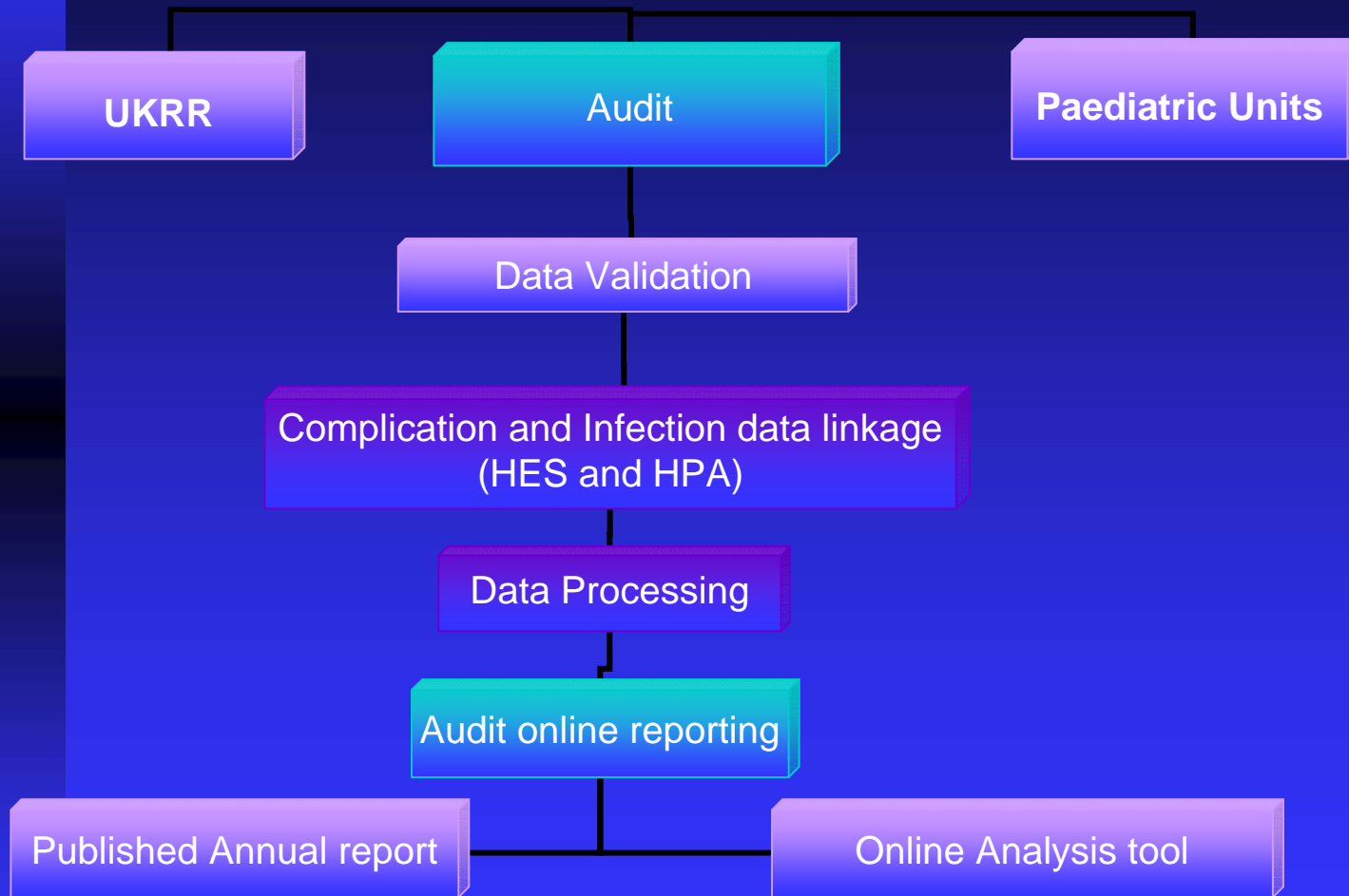
## Audit Scope:

- The Vascular Access audit will provide information on the timely and appropriate surgery for permanent vascular access based on the recommendations of the standards and quality requirements stated in the National Service Framework (NSF) for Renal Services

## Key Questions:

1. Does the proportion of patients starting haemodialysis with functioning permanent access meet the Renal Association and Vascular Society Guidelines for permanent vascular access?
2. What are the health care associated infection (HCAI) rates associated with vascular access in the maintenance haemodialysis population and how does this compare with the national average and the best performance?

# Audit Data Flow



# A look at Derby – IT support to audit

- Incident access
- Activity
  - Access at first RRT
  - Procedures
  - Interventions
  - Complications
- Not retrospective – i.e. data entry on incident activity
- Prevalent data item

# Incident events

## First Access

- Patient Details
- Timeline
- Investigation
- Chemistry
- Haematology
- Immunology
- Microbiology
- CAPD
- Nursing
- Renal Patientview
- Reports & Interfaces
- Patient charts
- Vascular Access
  - First Access
  - Access Clinic
  - Access Events

First Access

File Edit Search View Help

Dominant arm

Access at first RRT

Date of HIV test

HIV antigen

- AVF
  - AVG
  - non-TunLine
  - PD Cath Perm
  - PD Cath Temp
  - TunLine
  - Vein loop
- X



# Access clinic timeline

Patient Details
Timeline
Investigation
Chemistry
Haematology
Immunology
Microbiology
CAPD
Nursing
Renal Patientview
Reports & Interfaces
Patient charts
Vascular Access
First Access
Access Clinic
Access Events

Access Clinic

File Edit Search View Form Help

Date first seen in clinic	<input type="text"/>
Date on waiting list for access surgery	<input type="text"/>
Vascular access lab referral date	<input type="text"/>
Vascular lab appointment date	<input type="text"/>
Date referred for access construction 1	<input type="text"/>
Date scheduled access construction/insertion 1	<input type="text"/>
Date referred for access construction 2	<input type="text"/>
Date scheduled access construction/insertion 2	<input type="text"/>

0 of 0

# Access events

- Patient Details
- Timeline
- Investigation
- Chemistry
- Haematology
- Immunology
- Microbiology
- CAPD
- Nursing
- Renal Patientview
- Reports & Interfaces
- Patient charts**
- Vascular Access

- First Access
- Access Clinic
- Access Events

Access Events

File Edit Search View Grid Form Help

Date construction/insertion	<input type="text"/>	Date referred for construction	<input type="text"/>
Access type	<input type="text"/>	Anatomical side	<input type="text"/>
Site	<input type="text"/>	Date of first use	<input type="text"/>
Anaesthetic	<input type="text"/>		
Grade of surgical staff	<input type="text"/>		
Comment	<input type="text"/>		
Graft material	<input type="text"/>		
PD cath insert tech	<input type="text"/>		
Date of failure	<input type="text"/>		
Date of removal	<input type="text"/>		
Reason	<input type="text"/>		

Top part – defines an access

Bottom part – defines events associated with access

# Events

D	Type	Detail	Annotation
---	------	--------	------------

Navigation icons: Home, Left, Right, End, +, -, X, Filter, Refresh

- Patient Details
- Timeline
- Investigation
- Chemistry
- Haematology
- Immunology
- Microbiology
- CAPD
- Nursing
- Renal Patientview
- Reports & Interfaces
- Patient charts**
- Vascular Access
- First Access
- Access Clinic
- Access Events

Date	Type	Detail	Annotation
*			a

Navigation icons: Home, Left, Right, End, +, -, X, Filter, Refresh

Date	Type	Detail	Annotation
*			a

Context menu:  
Complication  
Revision  
Surveillance  
X

Navigation icons: Home, Left, Right, End, +, -, X, Filter, Refresh

Page info: New of 0

# Drop down events

Date	Type	Detail	Annotation
*	Complication	Catheter fell out Compartment Synd Endocarditis EPS Encaps Pert S Exit site infection Externalised cuff	a

Date	Type	Detail	Annotation
*	Revision	Angioplasty + cultir Angioplasty + stent Angioplasty balloor Arterial Jump Graft AVF aneurysm repa AVF banding AVF ligation AVF repair NOS	a

Layout Changed Alerts UnD

6) AND (LocalCode = -168)

Date	Type	Detail	Annotation
*	Surveillance	Angiography Blood flow measure Clinical exam Doppler studies Duplex U/S Other NOS Pressure measurem Recirc measurem	a

Layout Changed Alerts UnD

Dialysis Record First Access Access Clinic Acces

6) AND (LocalCode = -166)



# Prevalent dataset collection

Dialysis Record													
File Edit Search View Grid Help													
Date	Hrs.	Pre Wt.	Post Wt.	Target Wt.	Pre Sys	Pre Dia	Post Sys	Post Dia	Blood Flow Sp.	Access used	Machine	Number	
15/06/2009	4	62.7	62.2	61.5	151	66	121	57	114	AV Fistula S	Integra	61348	
12/06/2009	4	63.5	61.4	61.5	162	73	146	72	119	AV Fistula Simp	Integra	79+0591	
10/06/2009	4	63.8	61.0	61.5	161	67	148	62	129	AV Fistula Simp	Integra	65013	
08/06/2009	4	63.5	62.6	61.5	141	63	130	67	135	AV Fistula Simp	Integra	790736	
05/06/2009	4	62.6	61.8	61.5	148	71	160	63	139sn	AV Fistula Simp	Integra	65001	
03/06/2009	4	62.2	61.7	61.5	142	57	154	67	129	AV Fistula Simp	Integra	790743	
01/06/2009	4	64.6	61.7	61.5	164	68	163	69	119	AV Fistula Simp	Integra	75649	
29/05/2009	4	63.3	61.6	61.5	152	67	160	61	127s/n	AV Fistula Simp	Integra	75659	
27/05/2009	4	62.5	61.3	61.5	127	79	143	68	127	AV Fistula Simp	Integra	61376	
25/05/2009	4	62.7	62.0	61.5	162	77	163	75	124 s/n	AV Fistula Simp	Integra	65000	
22/05/2009	4	62.0	62.1	61.5	141	110	155	70	108	AV Fistula Simp	Integra	65003	
20/05/2009	3	62.8	61.6	61.5	162	76	120	57	124	AV Fistula Simp	Integra	65004	
18/05/2009	4	63.2	61.1	61.5	163	67	171	82	104	AV Fistula Simp	Integra	65004	
15/05/2009	4	62.8	61.5	61.5	111	52	165	75	114	AV Fistula Simp	Integra	58234	
13/05/2009	4	63.7	61.8	61.5	165	66	156	68	109	AV Fistula Simp	Integra	65003	
11/05/2009	4	63.7	61.8	61.5	155	74	145	65	124 SN	AV Fistula Comp	Integra	61358	
08/05/2009	4	63.5	61.5	61.5	143	71	159	67	129	AV Fistula Simp	Integra	61370	
06/05/2009	4	62.6	61.4	61.5	111	64	131	73	129 SN	AV Fistula Simp	Integra	61358	
04/05/2009	4	63.3	62.0	61.5	164	72	170	72	124s/n	AV Fistula Simp	Integra	58231	
01/05/2009	4	62.0	61.5	61.5	158	66	163	78	104s/n	AV Fistula Comp	Integra	58231	
29/04/2009	4	62.6	61.4	61.5	142	60	132	92	104s/n	AV Fistula Simp	Integra	65008	

# What does this allow us to do?

- Triangulation
  - Dialysis patients and demographics (UKRR)
  - Hospital episode statistics (HES)
  - Health Protection Agency (HPA) bacteraemia database (also CDT)

# Timelines

- First report due April 2010
- Pilot sites and early adopters
- UK wide
- 2 further reports due 2011 & 2012
- Hand over to the Registry 2012

# Lessons – making it work

- Make it simple
  - Key markers, easily defined and reported
- Make it relevant
  - Is it addressing a key issue?
- Make it important
  - Involve and report, support and encourage, share and compare

Questions?

**THANK YOU**