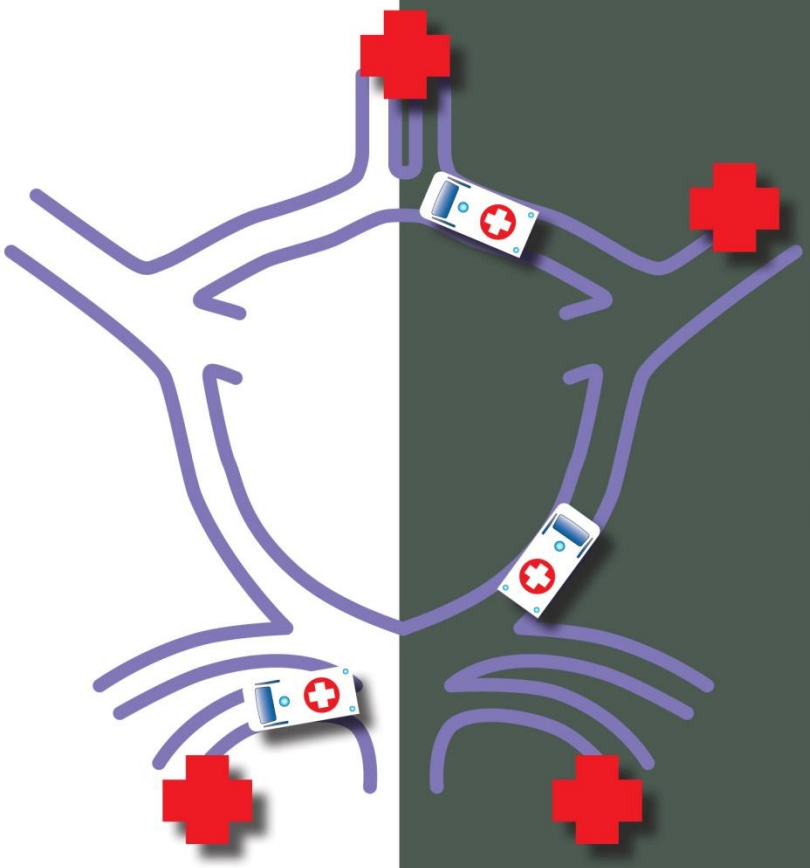
National Confidential Enquiry into Patient Outcome and Death



Managing the Flow?

A review of the care received by patients who were diagnosed with an aneurysmal subarachnoid haemorrhage

#aSAH

NCEPOD

Method
Hannah Shotton

Introduction

- SAH
  - Rupturing aneurysm
  - Poor outlook
- Intervention
  - Secure the aneurysm: clipping or coiling
  - Recommended 48 hours
  - Regional Specialist NSC
  - Conservative management

Introduction

- Previous work has focused on patients in NSC
- This study to examine entire acute pathway
  - Presentation to discharge in secondary/acute and tertiary care
  - Patients managed conservatively
  - Patients undergoing active intervention

Introduction

Expert Group:

- Neurosurgery
- Neuroradiology
- Neurology
- Stroke medicine
- Acute medicine
- Neurocritical care and anaesthesia
- Neuroscience nursing
- Lay representative

Aim

" To explore remediable factors in the process of care of patients admitted with the diagnosis of aneurysmal subarachnoid haemorrhage, looking at patients that underwent open surgery, interventional radiology and those managed conservatively"

Objectives

- To assess the organisational structures and policies for:
  - Diagnosis
  - Decision making
  - Definitive treatment
  - Post treatment care
  - Rehabilitation

Objectives

- To explore remediable factors in care of aSAH patients including:
  - Initial assessment
  - Admission process
  - Diagnosis
  - Decision making
  - Treatment
  - Rehabilitation

Hospital Participation

- Acute hospitals in England, Wales, Northern Ireland and the offshore islands
- 27 Neurosurgical & Neuroscience centres (NSCs)
- Organisational questionnaire
- Local Reporters, ambassadors, clinical lead

Study Population

- Adults presenting to secondary or tertiary care after suffering an aSAH
- Data collection period:

  1st July 2011 - 30th September 2011

Identification of Patients

- ICD10 code for SAH from hospital records
- Spreadsheet data
- Patients transferred between hospitals: data linked on NHS number & DoB

Data Collection

- Clinician questionnaires
  - Responsible consultant in secondary or tertiary care
  - Non-aneurysmal SAH excluded
  - Maximum 4 cases/ consultant
- Case note extracts
  - Secondary and tertiary care
  - Initial presentation to discharge

Data Collection

- Peer review

  Multidisciplinary Advisor group

  Case notes plus questionnaires: secondary only, tertiary only, linked secondary/tertiary

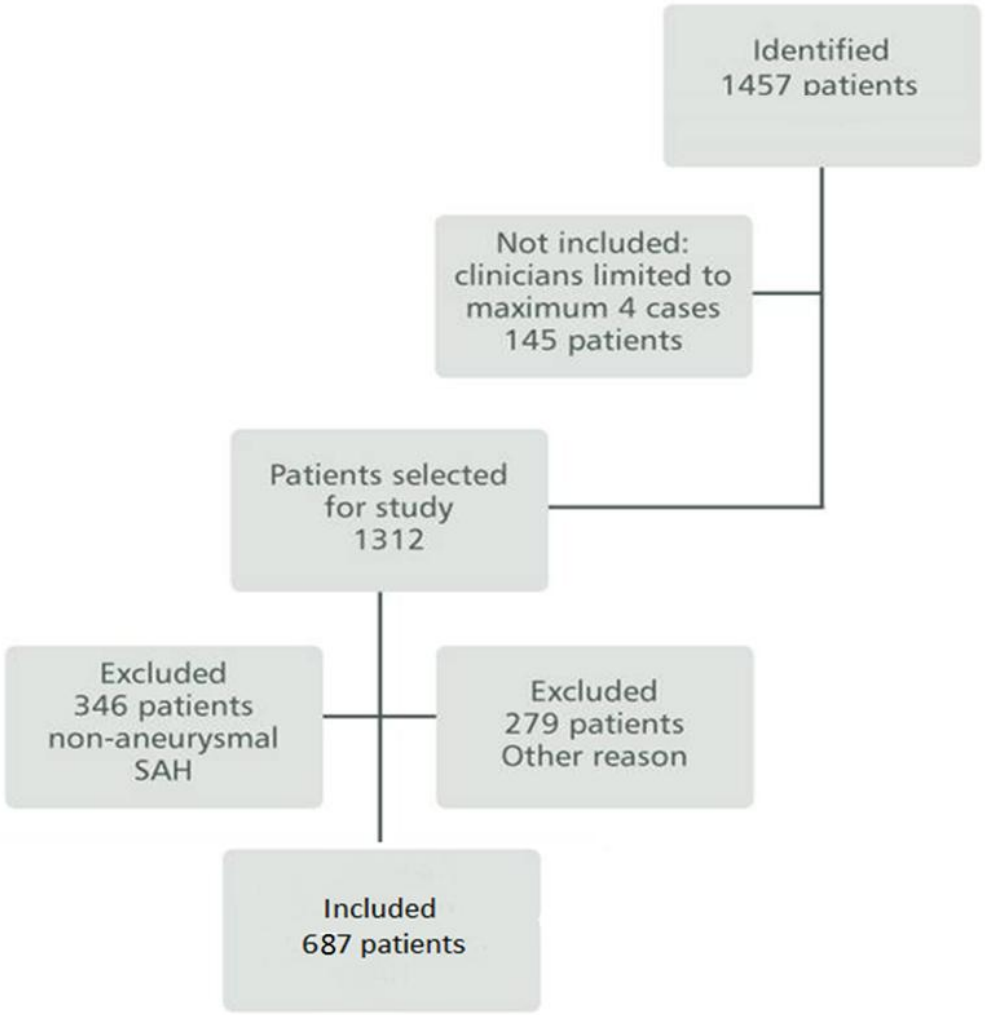
  Opinion on quality of care

  Advisor assessment form

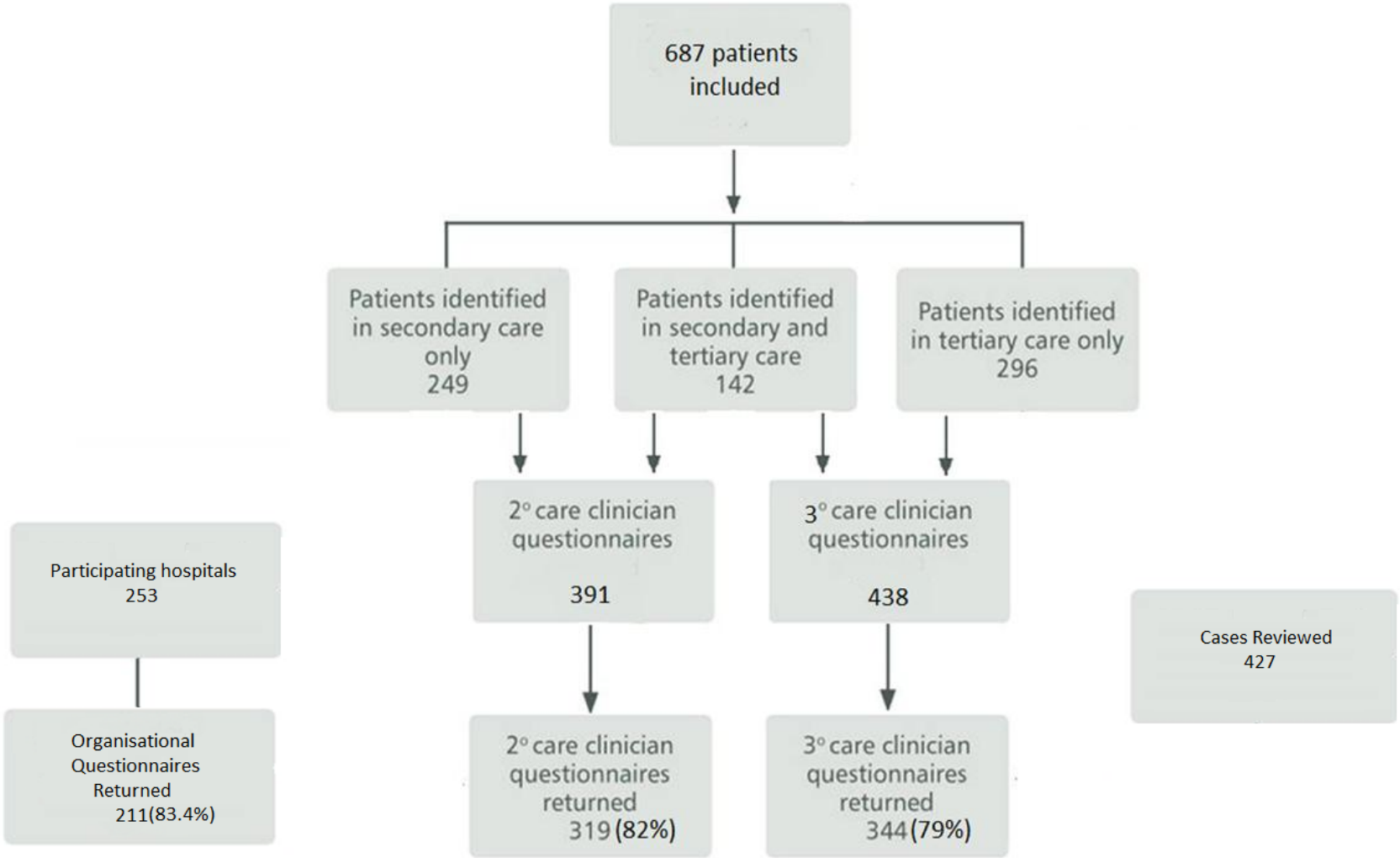
Data Collection

- Good Practice
- Room for improvement in clinical aspects of care
- Room for improvement in organisational aspects of care
- Room for improvement in BOTH clinical and organisational aspects of care
- Less than satisfactory

Case Inclusion



Data Returns



Organisational Data
Alex Goodwin

NCEPOD

Hospital Returns

Hospital type	n	%
District General Hospital <500	103	48.8
District General Hospital >500	50	23.7
Specialist Neurosurgical/ Neurosciences Centre	27	12.8
University Teaching Hospital	31	14.7
Total	**211**	

Table 2.1

Clinical Networks

- Formal 11.9%
- Informal 86.5%

Availability of Investigations

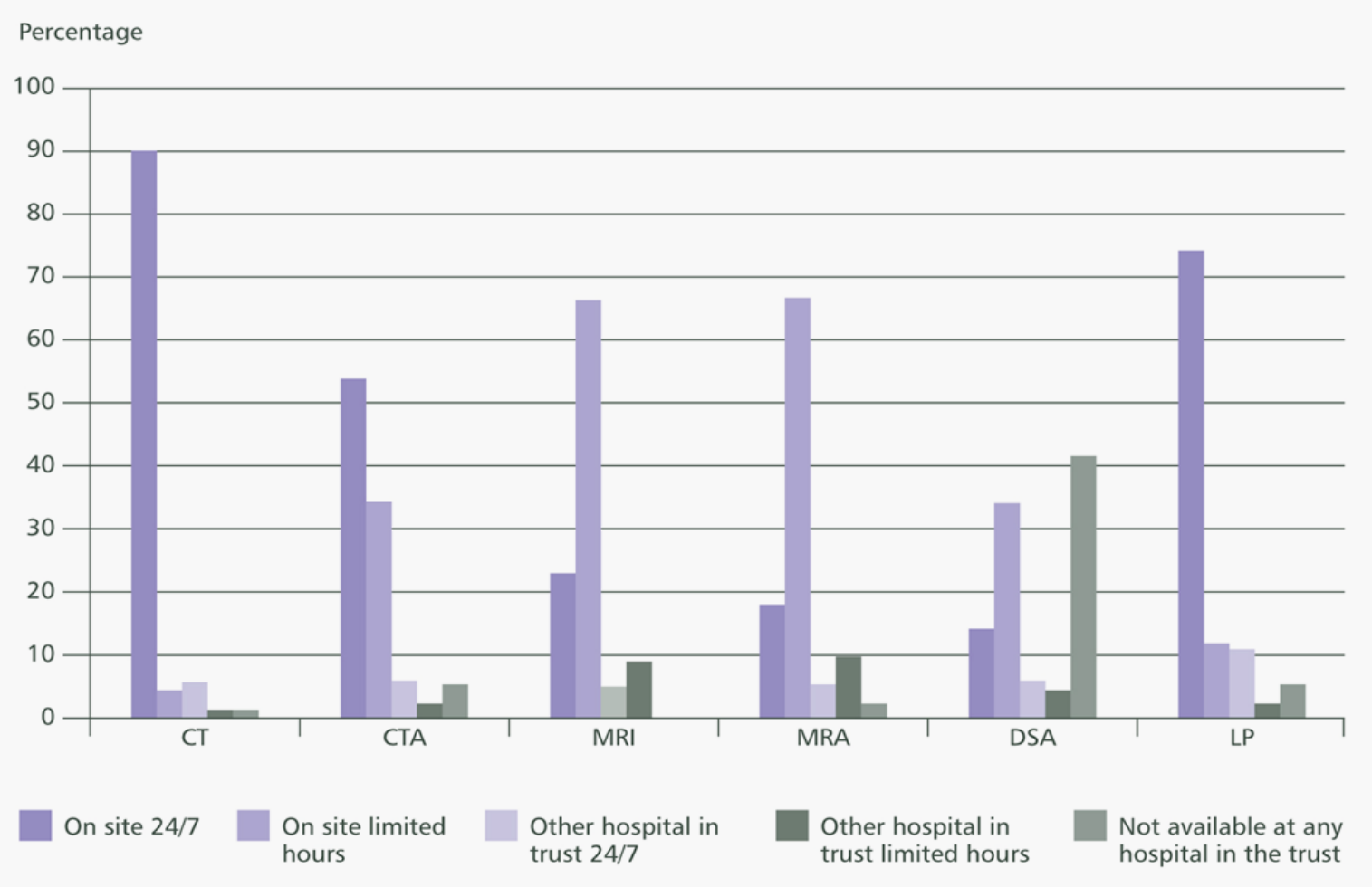


Figure 2.1

Lumbar Puncture

- 5.4% Unable to perform LP
- 25% Unable to perform LP 24/7
- 75% had no guidance as to who should perform LP

Case study 2

A patient was admitted to secondary care with a suspected aSAH. CT scan was negative. A junior clinician attempted a lumbar puncture but failed. As the patient's headache was subsiding no further attempts were made and no more experienced assistance requested. The patient was discharged on painkillers. The patient presented three days later with a re-bleed.

The Advisors commented that the opportunity to diagnose aSAH should not be missed. More experienced clinicians such as anaesthetists and radiologists should perhaps be approached to assist in cases such as this.

Secondary Care - Protocols

- Management of Acute Severe Headache 68%
- aSAH Management 72.4%

aSAH Management Protocol Includes…

Protocol that includes:	Yes (n/131)	%
CT head as soon as diagnosis proposed	121	92.4
Lumbar puncture if CT scan is negative	116	88.5
Immediate discussion with NSC if CT scan/lumbar puncture positive	127	96.9
Arranging transfer to NSC if appropriate	126	96.2
Active control of blood pressure	88	67.2
Administration of nimodipine	98	74.8
Determination of severity using WFNS classification	38	29.0

Table 2.8

Average Journey Time to Nearest NSC

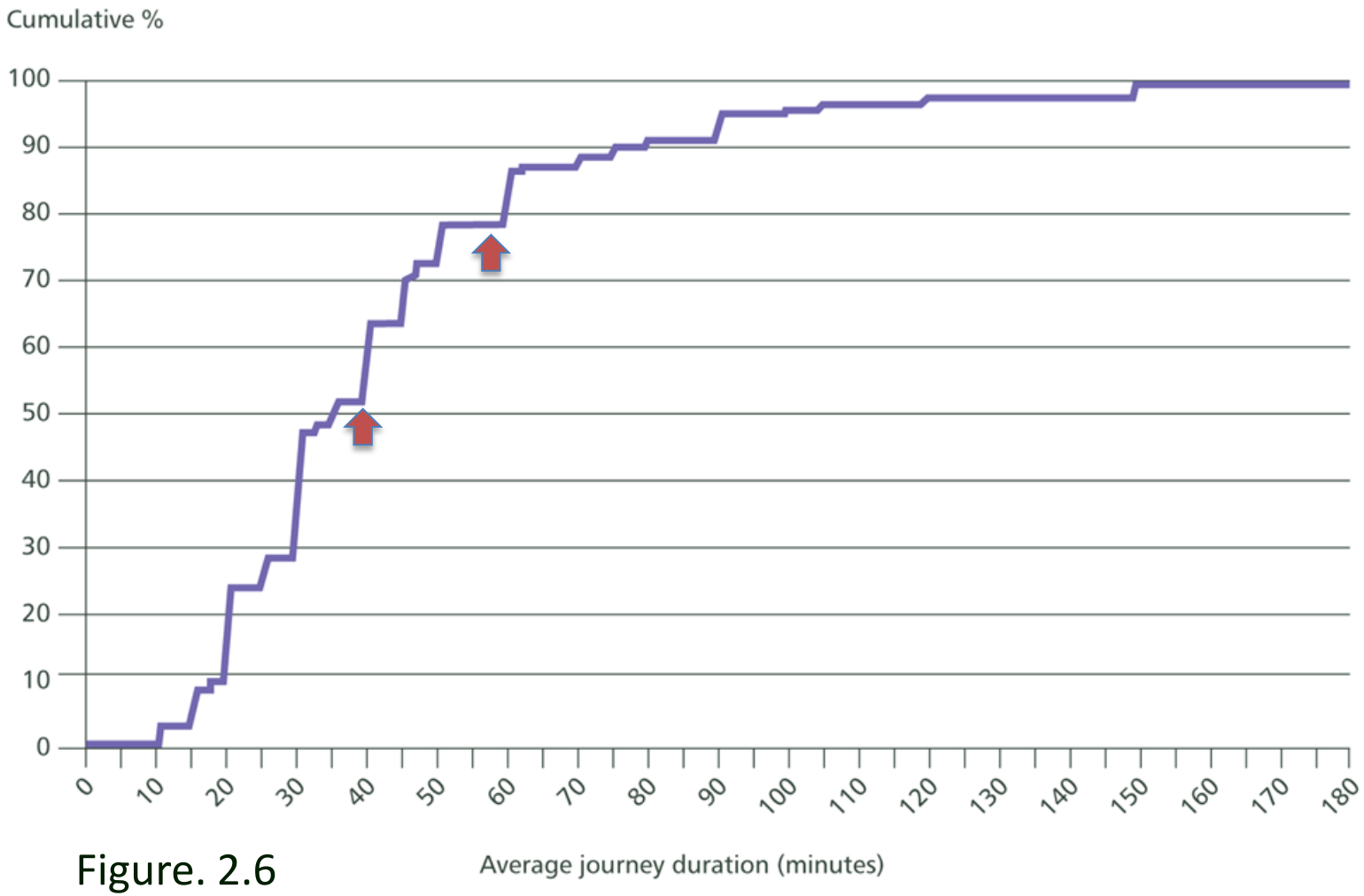


Figure. 2.6

Guidelines for Identifying Those for Conservative Management

- Only in 11.5% of hospitals
- Reasons for conservative management
  - Suitability for intervention
  - Co-morbidities
  - Conscious state
  - Age
  - Pre-morbid independence & cognitive state
  - Severity of bleed

Post-Procedure Support Available in Secondary Care

Support available	n/161	%
Specialist rehabilitation nurse	58	36.0
Physiotherapy	151	93.8
Occupational therapy	151	93.8
Specialist rehabilitation consultant	69	42.9
Neuropsychology	63	39.1
Other	24	14.9

Table 2.20

Governance - Regional Audit

Regional audit	n	%
Yes	25	19.2
No	105	80.8
Subtotal	**130**	
Unknown	49	
Not answered	32	
Total	**211**	

Table 2.22

Governance - Local Audit, M&M

M&M meeting	n
Yes	60
No	21
Subtotal	**81**
Unknown	17
Not answered	7
Total	**105**

Table 2.24

Timing of Intervention – Good Grade

Usually intervene in good grade patients:	n/19
<24 Hours	2
<48 Hours	7
<72 Hours	2
<120 hours	1
As soon as possible	3
Next working day if stable	2
Other	1
Not answered	2

Table 2.28

Timing of Intervention – Poor Grade

Usually intervene in poorer grade patients:	n/19
<24 Hours	4
<48 hours	3
Coiling as soon as possible, clipping delay-up to 10 days	2
Depend on clinical status	6
Next working day if stable	2
Other	1
Not answered	2

Table 2.29

Availability of Staff

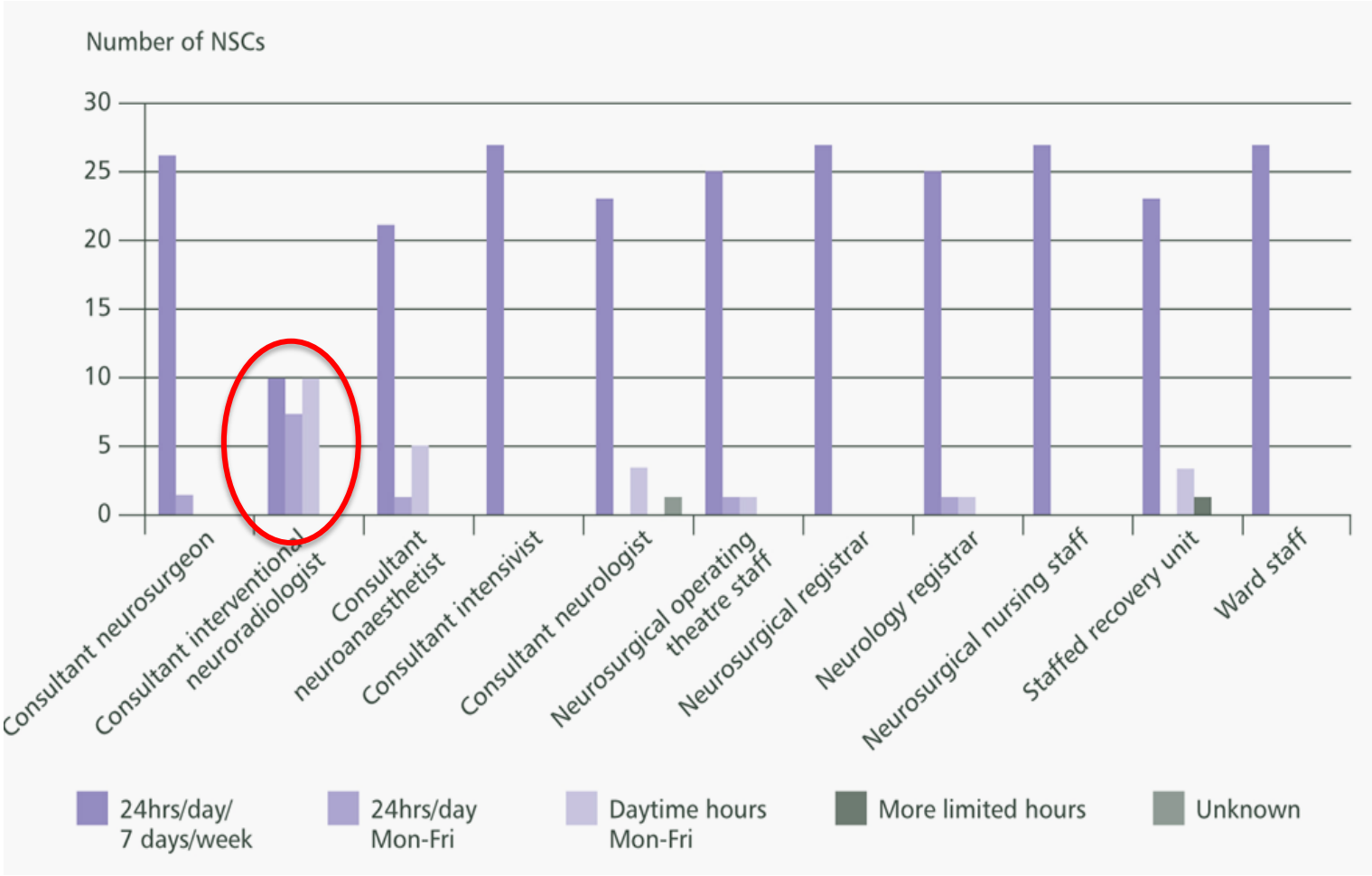


Figure 2.6

In-patient Rehabilitation (NSC)

Inpatient rehabilitation	n/21
Inpatient physiotherapy	21
Inpatient occupational therapy	21
Rehabilitation nurse specialist	15
Rehabilitation consultant	18
Neuropsychology	20
Other	2

Table 2.37

Services Available Post-Discharge (NSC)

Services post discharge	n/27
Hospital at home	5
Specific case worker	4
Neuropsychology	12
Specialist nurse	10
Physiotherapy	24
Physiotherapy (domiciliary)	10
Occupational therapy	24
Occupational therapy (domiciliary)	11
Other	3

Table 2.38

Organisational Data
Key Findings in Secondary Care

- 32% had no protocol for managing headache
- 29% used WFNS grading
- 85% within 50 miles / 1 hour of NSC
- 70% had no formal transfer protocol

Organisational Data
Key Findings in Tertiary Care

- 22/27 (81%) NSCs did not have a policy for optimal timing of definitive care
- 20/27 NSCs (75%) had no policy for pre-operative care of aSAH
- 17/27 (63%) NSCs lacked interventional radiology services 7 days a week

Organisational Data
Key Findings in Both Secondary & Tertiary Care

- 88% not part of formal network
- 25% of hospitals were unable to perform LPs 24/7
- 75% lacked policies for the performance of LPs
- 80% failed to participate in regional audit
- 40% of secondary hospitals offered neuropsychological support compared to 20/27 (75%) of NSCs

Organisational Data Recommendations

- Establish formal networks of care linking secondary and tertiary care
- Regional audit and MDT meetings should take place in all hospitals
- Availability of interventional neuroradiology should allow compliance with treating patients within 48 hours of onset

Secondary Care

Demographics - Age

	All	Female	Male
Mean	58.7	60	55.9
Median	57	60	55
Range	24-97	24-97	27-89

Table 3.1

First Presentation to Hospital

- Secondary care 82.4%
- Hospital with onsite NSC 17.6%

Day of Presentation

Day of the week	n	%
Monday	72	16.9
Tuesday	60	14.1
Wednesday	73	17.1
Thursday	58	13.6
Friday	58	13.6
Saturday	46	10.8
Sunday	60	14.1
Total	**427**	

Table 3.3

Time of Arrival

Time of arrival to secondary care	n	%
00:00-07:59	48	12.7
08:00-17:59	229	60.6
18:00-23:59	101	26.7
Subtotal	**378**	
Insufficient data	49	
Total	**427**	

Table 3.4

Initial Assessment – Grade of Clinician

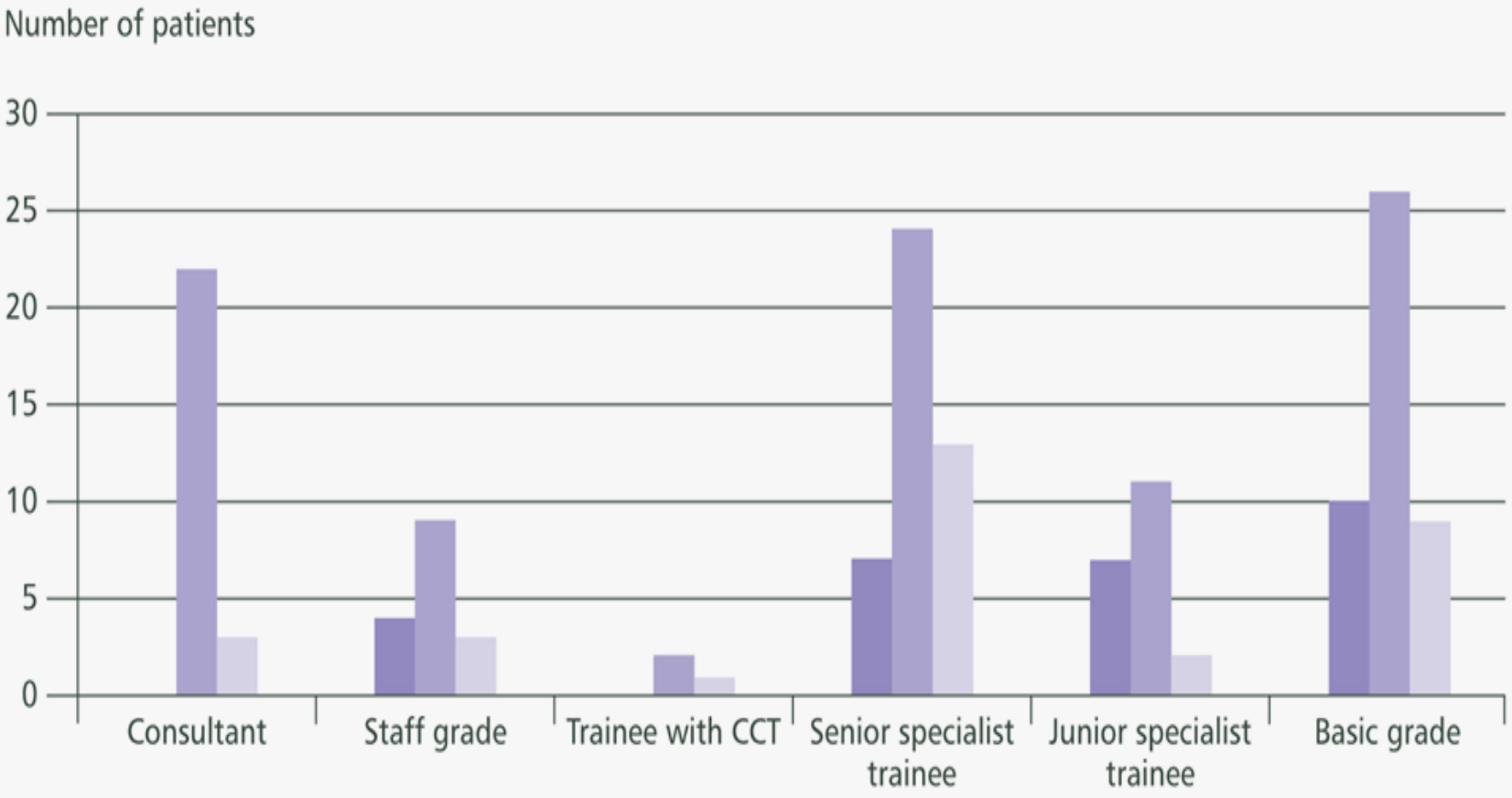


Figure 3.3

Pre-morbid Functional Status

40% with Hypertension

Functional status prior to aSAH	n	%
No symptoms	269	69.9
No significant disability despite symptoms	43	11.2
Slight disability	36	9.4
Moderate disability	22	5.7
Moderate to severe disability	11	2.9
Severe disability	4	1.0
Subtotal	**385**	
Unknown	42	
Total	**427**	

Table 3.8

GCS at First Assessment

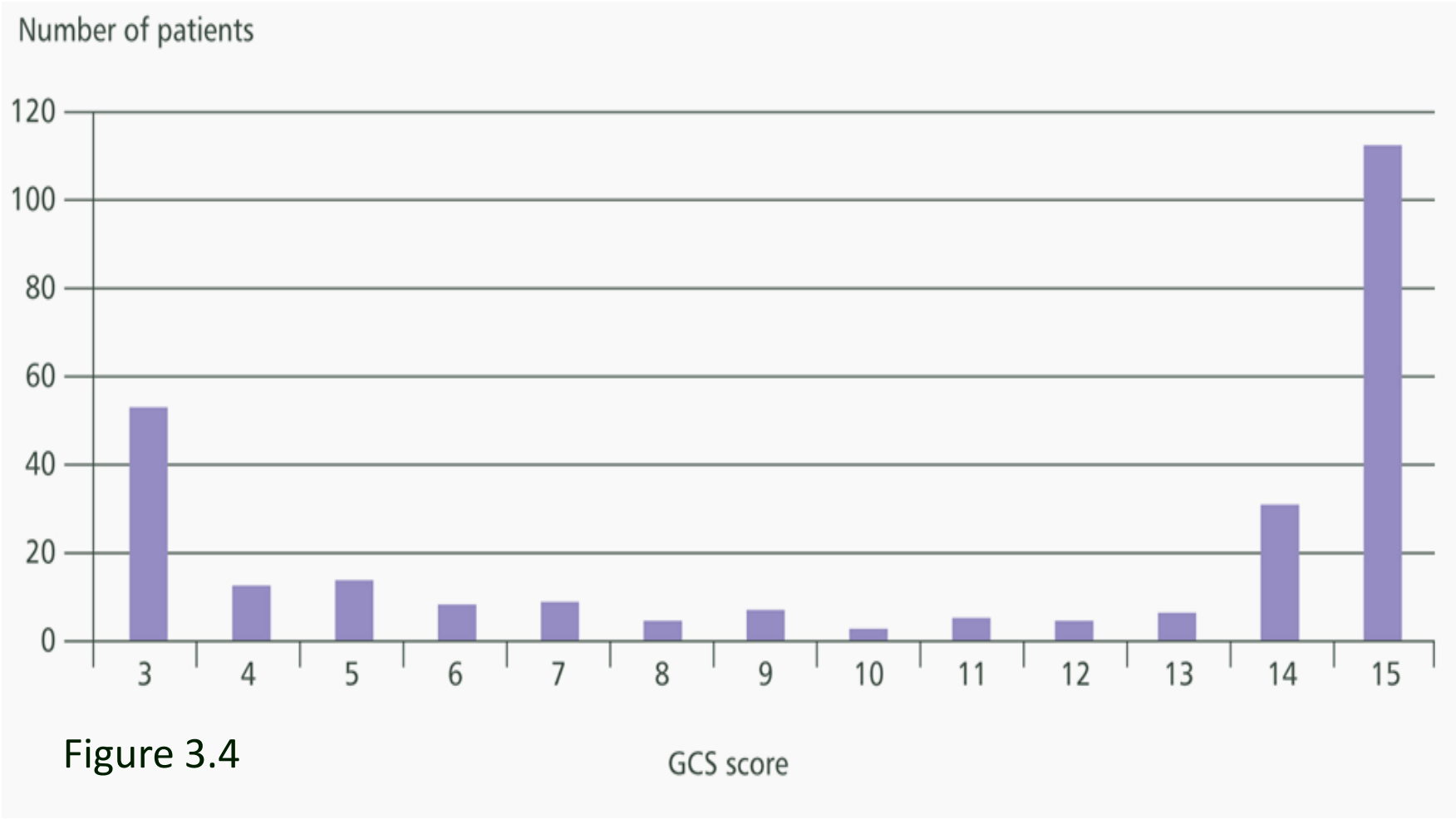


Figure 3.4

CT Scan - Timing

Time from arrival in secondary care to CT	n	%
0-1 hr	96	32.1
>1-3 hr	100	33.4
>3-6 hr	41	13.7
>6-12 hr	22	7.4
>12-24 hr	15	5.0
>24-48 hr	11	3.7
>48 hr	14	4.7
Subtotal	**299**	
Insufficient data	91	
Total	**390**	

Table 3.13

CT Scan - Delays

Delay occuring to the request of CT scan during normal working hours and out of hours	Delay	No delay	Total	% delayed
In hours	9	117	126	7.1
Out of hours	19	140	159	11.9
Subtotal	**28**	**257**	**285**	
Insufficient data	2	12	14	
Total	**30**	**269**	**299**	

Table 3.15

Case study 5

A middle aged patient presented to a district general hospital with a worsening headache, vomiting and visual disturbance. Following a discussion with a consultant physician the patient was admitted to the medical assessment unit for observation. The following day a consultant reviewed the patient and decided to perform a non-urgent CT scan, despite the fact that their symptoms had not resolved. The CT scan was performed the following day when a "significant" aSAH was diagnosed. The patient was transferred to a neurosurgical centre, where they underwent coiling within 24 hours of admission.

The Advisors considered that there was an unnecessary delay in performing a CT scan which delayed diagnosis in secondary care.

Appropriately Timed Diagnosis

Diagnosis made within an appropriate time frame	n	%
Yes	334	87.2
No	49	12.8
Subtotal	**383**	
Insufficient data	44	
Total	**427**	

Table 3.18

Delayed or Overlooked Diagnosis

(Advisors' Form)

Primary Care

- 17.6% of patients saw GP
- Delayed or overlooked in 32/75
- Outcome affected in 23/32

Secondary Care

- Delay or overlooked in 12%
- Outcome affected in 10/49

Table 3.18

Case study 6

An elderly patient attended their local emergency department with severe headache (nothing similar previously) and nausea. The patient was drowsy but rousable. ECG showed some T-wave inversion. The patient had marginally elevated troponin, but no chest pain and was prescribed aspirin and low molecular weight heparin. The patient was admitted to a cardiac ward and reviewed by consultant 18 hours later who asked for cerebral CT scan. This was performed 3 days later followed by a CT Angiogram which confirmed an aneurysm. The patient was transferred to a neurosurgical centre for coiling.

The Advisors commented that initial symptoms and signs were ignored. It was not appreciated that ECG changes and rises in troponin occur in aSAH patients.

Case study 9

An elderly patient collapsed and presented to a district general hospital. A CT scan showed an aSAH and the patient was referred to the local neurosurgical centre (NCS) with a GCS of 14 (WFNS grade II). There was a delay in transfer due to the time taken to accept the patient, during which they deteriorated to a GCS of 8. The patient was finally transferred unintubated and breathing spontaneously. On arrival at the NSC they were immediately intubated and went to theatre for an emergency decompression. Sadly this patient did not survive.

The Advisors considered that both the delay in transfer and the sub standard medical treatment during transfer were contributors to the outcome.

aSAH Management in Secondary Care - Nimodipine

Nimodipine given	n	%
Yes	126	46.8
No	143	53.2
Subtotal	**269**	
Not applicable	27	
Unknown	12	
Not answered	11	
Total	**319**	

Table 3.26

Delays in Referral Process

		Referral	Contact in NSC	Acceptance
In hours	Delay	1	2	14
	No Delay	126	127	97
	% delay	<1	1.6	12.6
	Subtotal	**127**	**129**	**111**
Out of hours	Delay	9	12	22
	No Delay	156	150	139
	% delay	5.5	7.4	13.6
	Subtotal	**165**	**162**	**161**
Overall	**Subtotal**	**292**	**291**	**272**
	Insufficient data	18	16	0
	Total	**310**	**307**	**272**

Table 3.35

Delayed Acceptance by NSC

• Lack of beds	13
• Staffing issue	6
• Other	17
• Total	36

Delay in Transfer

- Delay in 17.9%
- Deterioration during delayed transfer 10/47

Conservative Management

Managed conservatively	n	%
Yes	142	33.3
No	285	66.7
Total	**427**	

Table 3.38

Conservative Management

Reasons for conservative management	n/131	%
Unsurvivable haemorrhage	102	77.9
Neurological state	59	45.0
Co-morbidities	27	20.6
Inoperable aneurysm	6	4.6
Other	5	3.8
No rationale documented	2	1.5
Patient decision	1	0.8

Table 3.39

Conservative Management

Decision to manage conservatively was appropriate	n	%
Yes	127	94.1
No	8	5.9
Subtotal	**135**	
Insufficient data	7	
Total	**142**	

Table 3.40

Quality of Care in Secondary Care

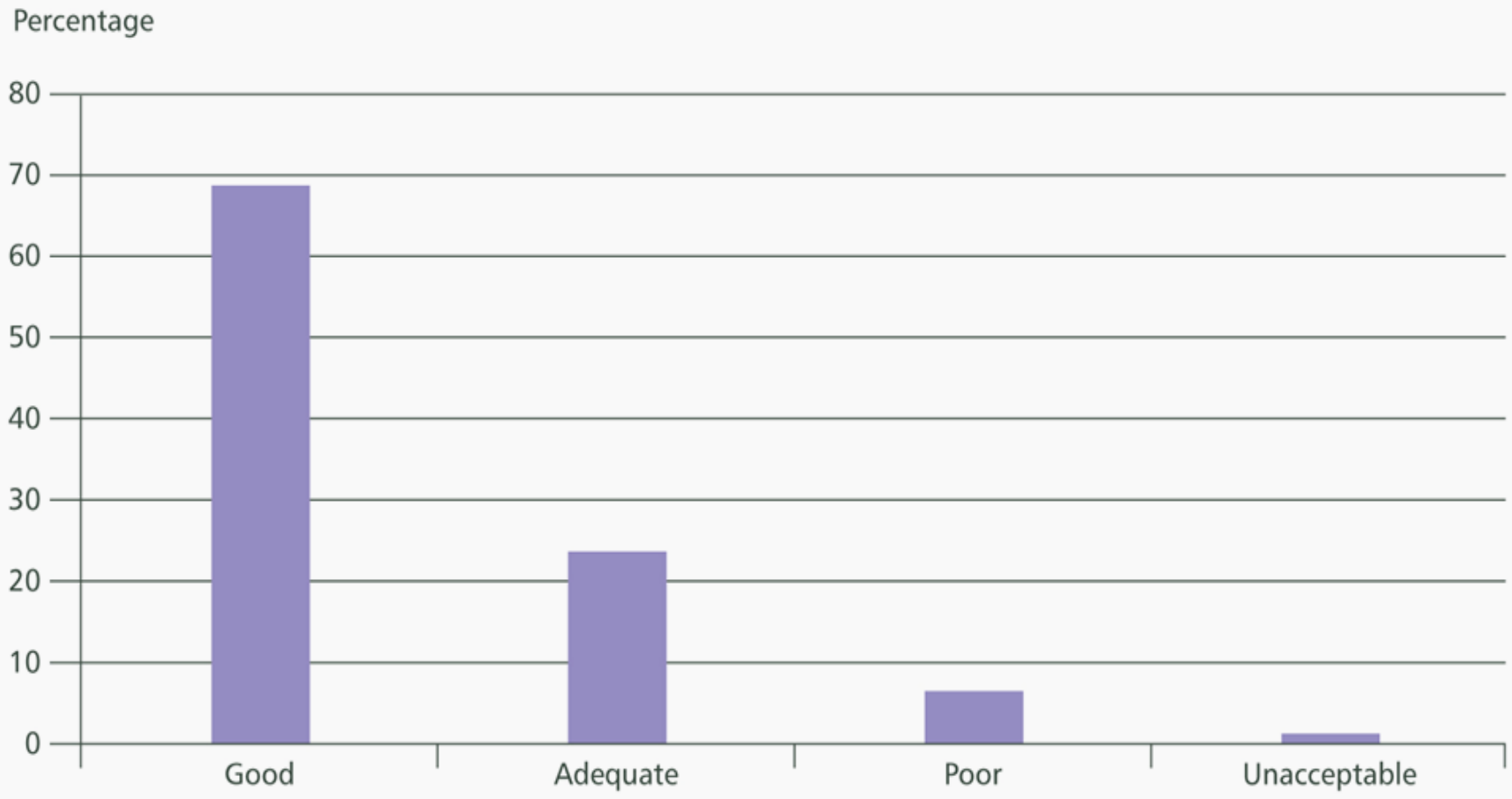


Figure 3.6 Advisor rating of quality of secondary care

Quality of Care in Secondary Care

Reasons for poor/unacceptable rating	n
Delay in performing CT head	12
Delayed/missed diagnosis	10
Deficiencies in the initial assessment	4
Lack of senior review	1
Total	**27**

Table 3.43

Secondary Care - Key Findings

- 32/75 patients in primary care had diagnosis overlooked
- 12.8% of patients in secondary care did not have a timely diagnosis
- 51 patients experienced a delay related to their CT scan, this delay resulted in an altered outcome for 4
- 67.9% of patients in secondary care did not have a CT scan within one hour of admission

Secondary Care - Key Findings

- 46.4% of patients did not receive Nimodipine in secondary care following diagnosis
- The decision to manage conservatively was considered appropriate in 94.1% of patients
- Delays in the referral process were more common out of hours
- 68.8% of patients received good care

Secondary Care - Recommendations

- The clinical presentation of aSAH should be highlighted in educational programmes

- Patients presenting with an acute severe headache should be thoroughly examined and a CT scan performed within one hour

Secondary Care - Recommendations

- Standard protocols for the management of patients with aSAH should be adopted
- Patients diagnosed with aSAH should be started on nimodipine

Tertiary Care
Michael Gough

Source of Admission
(Advisors' Form)

Source of admission	n	%
Transfer from different secondary care hospital	228	75.2
From emergency department in the hospital with the NSC	61	20.1
From another department in hospital with the NSC	14	4.6
Total	**303**	

Table 4.1

Initial Assessment in NSC
(Advisors' Form)

Grade of clinician	n	%
Consultant	5	2.0
Associate Specialist/Staff Grade	1	<1
Trainee with CCT	7	2.9
Senior Specialist Trainee	125	51.0
Junior Specialist Trainee	40	16.3
Basic Grade	63	25.7
Other	4	1.6
Subtotal	**245**	
Insufficient data to assess	58	
Total	**303**	

Table 4.6

Poor examination 12.1%

Poor planning I_x 8.3%

Time to Consultant Review
(Clinician Questionnaire)

Time from admission to NSC to consultant review	n	%
Less than 6 hours	79	32.1
6-12 hours	80	32.5
12-24 hours	69	28.0
24- 48 hours	18	7.3
Subtotal	**246**	
Unknown	93	
Not answered	5	
Total	**344**	

Table 4.8

Clinically important 14%

Not documented 45%

Unknown 93

Deficiencies in Admission Process
(Advisors' Form)

Deficiencies	n	
Delayed acceptance by NSC	14	*
Delay in consultant review	8	
Poor documentation	5	
Delay in CTA/investigations	4	
Delay/deficiency in initial assessment	4	
Level of care	1	
Total	**36**	13.1%

Table 4.9

*Outcome affected in 2/14

Investigations Following Admission
(Clinical Questionnaire)

73% underwent CTA: confirm aneurysm, plan T_x

Reasons why CTA was not performed	n
Suitable study done in referring hospital	51 *
Patient underwent DSA	16
Patient died before investigation possible	6
Other	13
Subtotal	**86**
Not answered	4
Total	**90**

Table 4.10

* Data transfer crucial

Decision on Treatment Method
(Clinical Questionnaire)

Decision made at MDT meeting	n	%
Yes	140	47.3
No	156	52.7
Subtotal	296	
Unknown	13	
Total	**309**	

Table 4.11

No documentation of discussion in nearly 1/4

Delay in Treatment Planning
(Advisors' Form)

Delayed treatment plan	n	%
Yes	24	9.6
No	226	90.4
Subtotal	**250**	
Insufficient data	53	
Total	**303**	

Table 4.12

11/24 = delay in performing CTA/DSA

Treatment Method for Aneurysm
(Clinical Questionnaire)

International Subarachnoid Aneurysm Trial (ISAT)
Dependent/dead at 60/7: 25.4% v 36.4%, RRR 22.6%

Definitive treatment for aneurysmal SAH	n	%
Aneurysm coiling	258	84.9
Aneurysm clipping	40	13.2
Aneurysm clipping after attempted coiling	6	2.0
Subtotal	**304**	
Unknown	5	
Total	**309**	

Table 4.17

26 conservative management
(15 presented to tertiary hospital)

Who Gave Consent?
(Clinical Questionnaire)

Source of consent	n	%
Patient	205	68.8
Form 4: patient unable to give consent	93	31.2
Subtotal	**298**	
Unknown	6	
Not answered	5	
Total	**309**	

Table 4.15

WFNS grade	
I	160
II	33
III	7
IV	2

Delays in Definitive Treatment
(Advisors' Form)

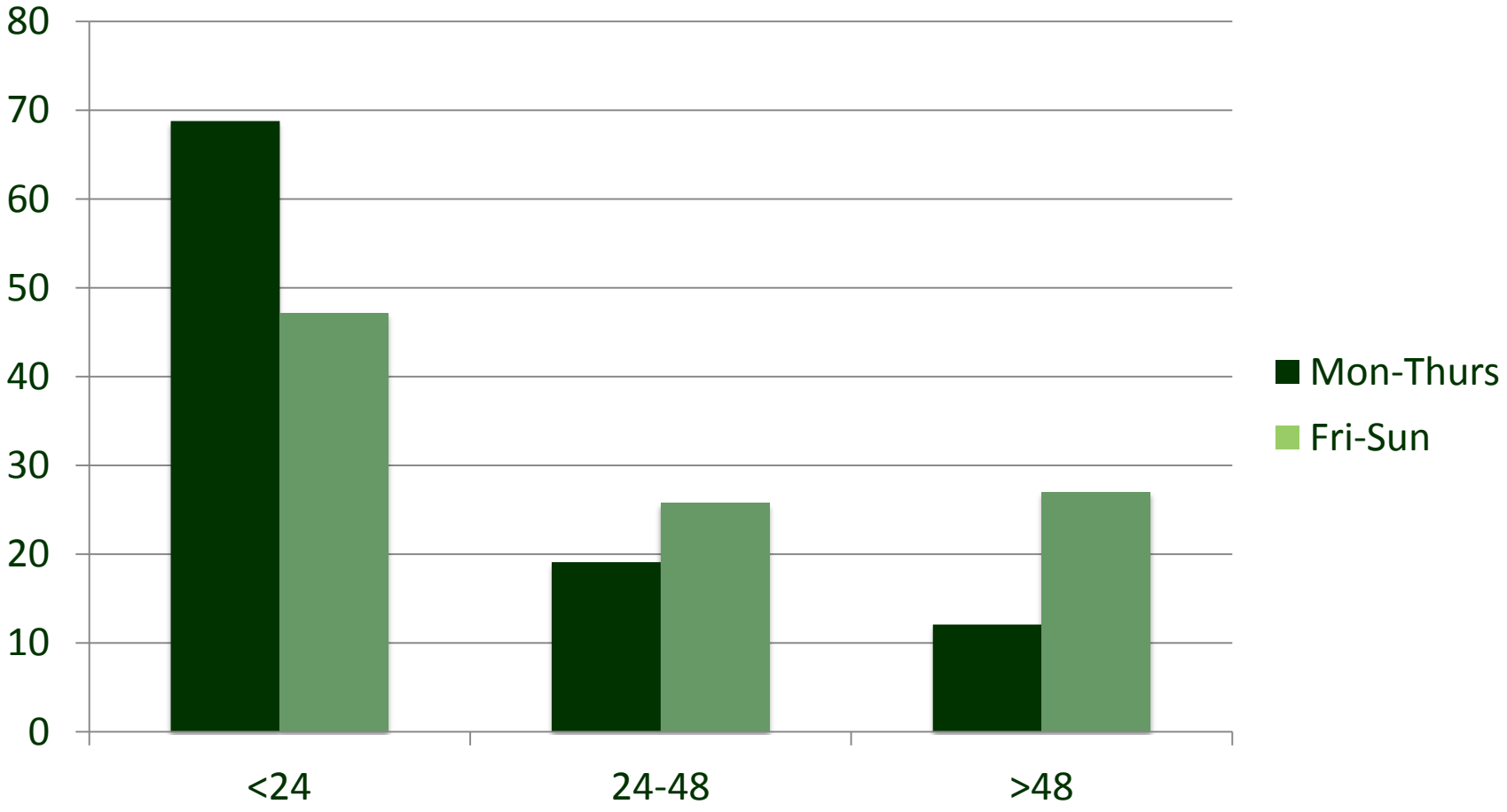
No service over the weekend	23
Admitted out of hours	4
Problems with equipment	3
Lack of anaesthetic cover	2
Patient had vasospasm	2
Delay in obtaining CTA	1
EVD inserted	1
Awaiting MDT	1
Lack of surgical cover	1
Treatment plan changed	1
Subtotal	**39**
No reason given	14
Total	**53**

Delay in controlling aneurysm 21.6%

>10% insufficient data

5/53: outcome affected

Day of Admission
Time to Treatment in 246 Patients



Comparison of time from admission to intervention by day of admission

Case study 11

A middle-aged patient presented to a DGH with a history of headache and seizure. A large aSAH with intraventricular haemorrhage was found on CT scan. Within 4 hours they were transferred to the local neurosurgical centre (NSC). Despite arriving at the NSC on a Saturday morning, endovascular intervention was delayed until Tuesday. There was no entry in the notes for Monday (a bank holiday). The patient was discharged sixteen days later having undergone coiling of an aneurysm.

The Advisors considered this case to be an example of delay in treatment caused by a lack of 7 day service in neuroradiology.

Time to Treatment
Risk of Disease-specific Complications

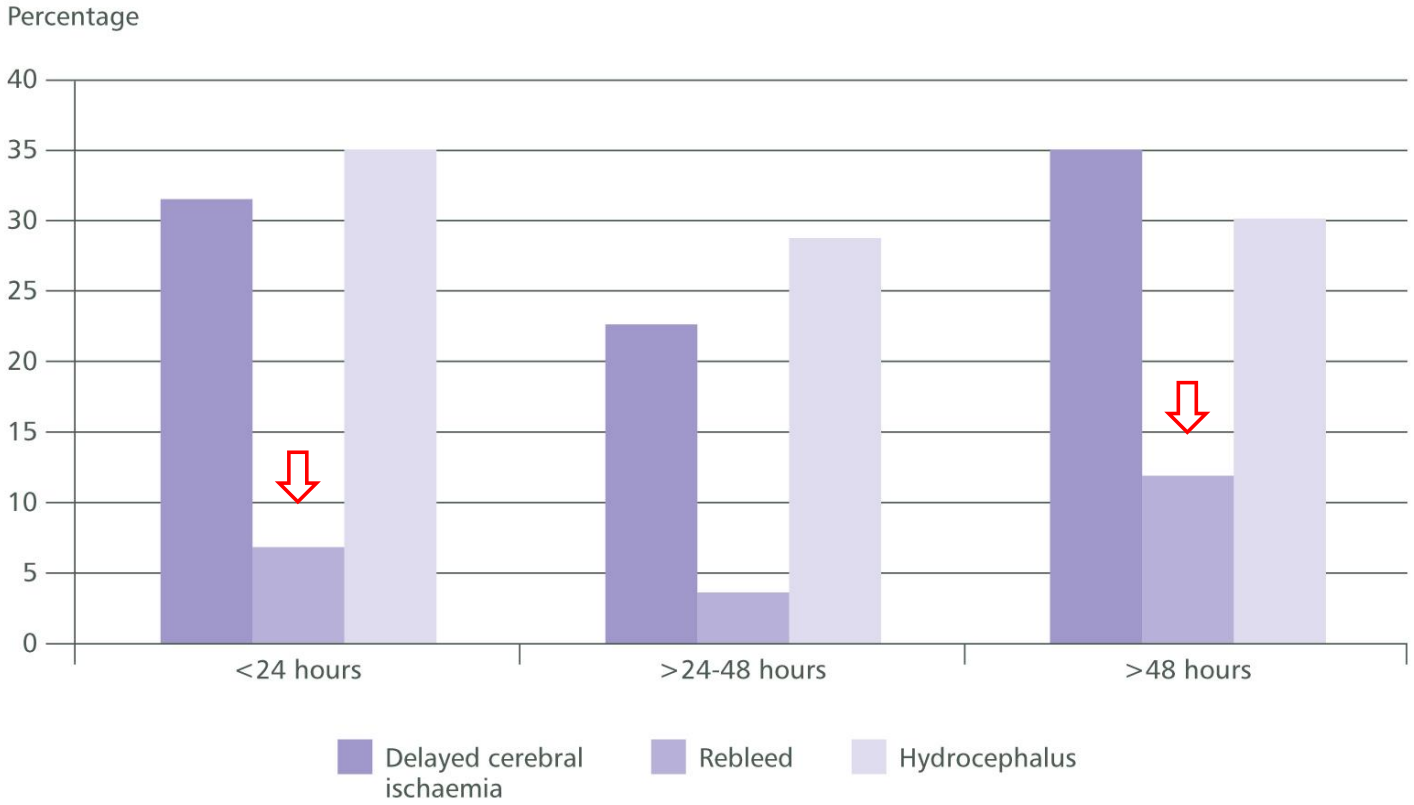


Figure 4.3 The relationship between time to intervention and the frequency of delayed cerebral ischaemia, re-bleeding and hydrocephalus
(Advisor assessment form) n=246 (Insufficient data in 31; 24 hours n=150; 24-48 hours n=53; >48 hours n=43)

Time to Treatment & Other Complications
(Advisors' Form)

'Other' complications of aSAH	n
Cardio-respiratory (Myocardial infarction, myocardial stunning, arrhythmia, pulmonary oedema/infection	8
Cerebral infarction/stroke	6
Cerebral oedema	3
Cognitive impairment/memory loss	3
Cranial nerve palsy	4
Hyponatraemia +/- cerebral salt wasting syndrome	5
Intraoperative rupture/intra-ventricular haematoma	1
Seizures	2
Sepsis/ventriculitis	3
Total	**35**

Table 4.20

Time to Treatment & Other Complications
(Advisors' Form)

Time delay	'Other' complications of aSAH	n	%
<24 h	14	150	9.3
>24-48 h	6	53	11.3
>48 h	15	43	34.9
Insufficient data		31	
Total		**277**	

Table 4.18

'Other' complications of aSAH	n
Cardio-respiratory (Myocardial infarction, myocardial stunning, arrhythmia, pulmonary oedema/infection	8
Cerebral infarction/stroke	6
Cerebral oedema	3
Cognitive impairment/memory loss	3
Cranial nerve palsy	4
Hyponatraemia +/- cerebral salt wasting syndrome	5
Intraoperative rupture/intra-ventricular haematoma	1
Seizures	2
Sepsis/ventriculitis	3
Total	**35**

Table 4.20

Time to Treatment
Functional Status at Discharge

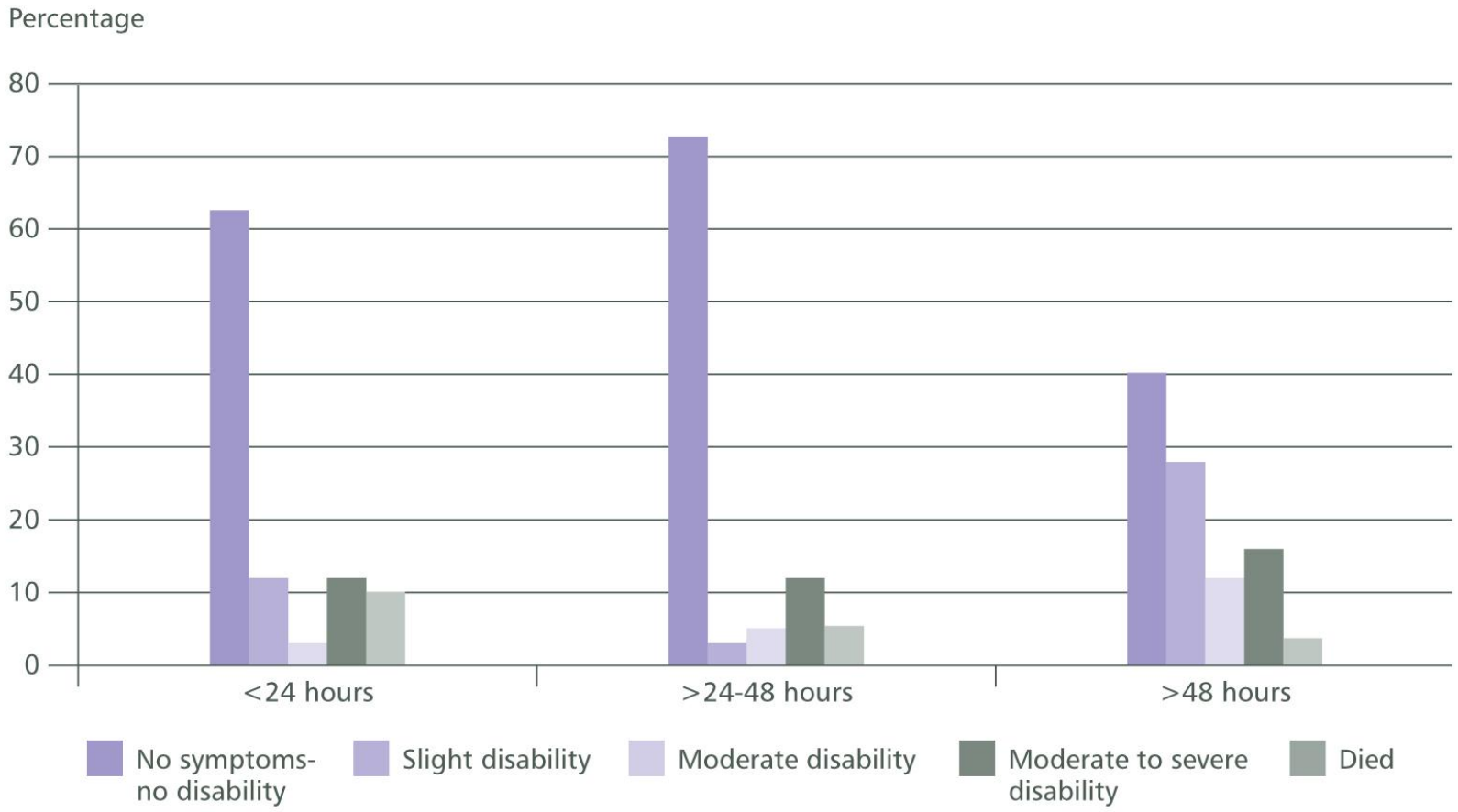


Figure 4.4 The relationship between time to intervention and functional status at discharge from the NSC

(Advisor assessment form) n=246 (Insufficient data in 31; 24 hours n=150; 24-48 hours n=53; >48 hours n=43))

A 7-day Service

Networks

Intery AUDIT iology

Surgeons

Grade of Surgeon/Radiologist
(Clinical Questionnaire)

Grade of operating surgeon/neuroradiologist	n	%
Consultant	281	91.5
Senior trainee - supervised by scrubbed consultant	24	7.8
Senior trainee - supervised by un-scrubbed consultant	2	0.7
Subtotal	**307**	
Unknown	2	
Total	**309**	

Table 4.22

Procedural Complications
(Advisors' Form)

Procedural complications	n	%
Yes	48	18.3
No	214	81.7
Subtotal	**262**	
Insufficient data	15	
Total	**277**	

Table 4.24

Rupture during treatment 7/239 & 2/44
Thromboembolic 8/239: 4 CVA

Failure to occlude: 1.7% v 0.5%
Access vessel occlusion: 2.1% v 0.69%

Mortality Following Intervention
(Advisors' Form)

Primary Procedure	n	Died	Discharged alive	Mortality (%)
Open surgery	38	1	37	2.6
Endovascular intervention	233	18	215	7.7
Both: Endovascular intervention followed by surgery	6	0	6	0.0

Table 4.30

Identical to ISAT

Re-bleeding Post-intervention
(Clinical Questionnaire)

Re-bleed	n	%
Yes	24	7.1
No	313	92.9
Subtotal	**337**	
Not answered	7	
Total	**344**	

Table 4.32

Cochrane Review 4.2%

Outcome: Re-bleeding
(Clinical Questionnaire)

Outcome	n
Delayed death	10
Persistent poor grade	2
Improvement and further treatment	3
Recovery to pre re-bleed condition	6
Suffered other complications and died	1
Not answered	2
Total	**24**

Table 4.37

Delayed Cerebral Ischaemia
(Clinical Questionnaire)

Delayed cerebral ischaemia	n	%
Yes	76	22.6
No	260	77.4
Subtotal	**336**	
Insufficient data	8	
Total	**344**	

Table 4.39

Early brain injury > vasospasm
Electrolytes, cortical spreading depression, microthrombosis

Treatment of Delayed Cerebral Ischaemia
(Clinical Questionnaire)

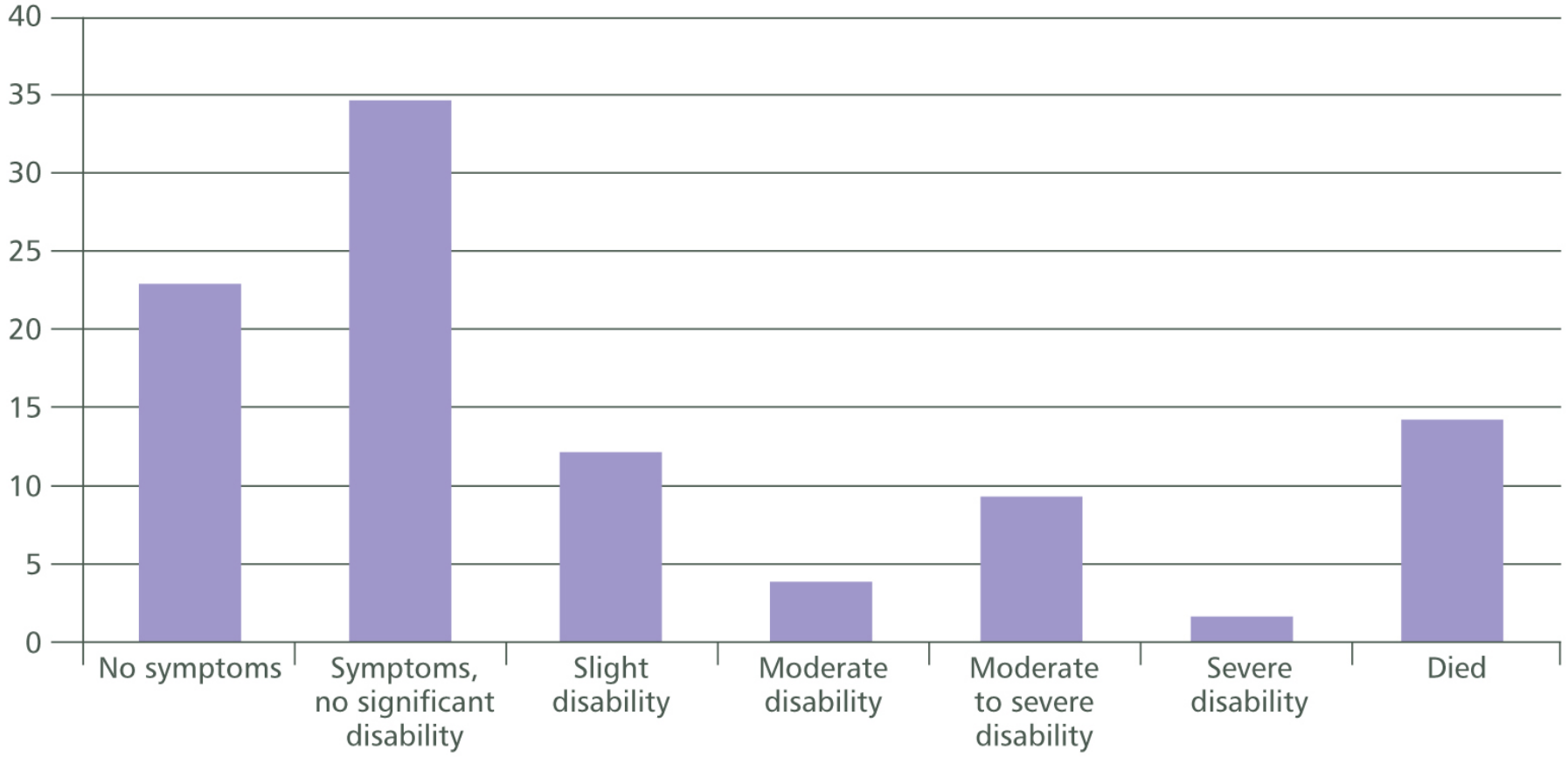
Treatment for delayed cerebral ischaemia	n
Intravenous crystalloid fluids	57
Hypertonic saline	7
Intravenous colloidal fluid	19
Induced hypertension	38
Induced hypervolaemia	22
Induced haemodilution	16
Balloon angioplasty	2
Pharmacological (angiographic)	5
New/additional CSF drainage	6
Other	16

Table 4.41

Hypertension, Hypervolaemia, Haemodilution

Functional Status at Discharge

The Need for Rehabilitation Services



2/3 had symptoms or disability

WFNS Grade and Outcome

The Need for Rehabilitation Services

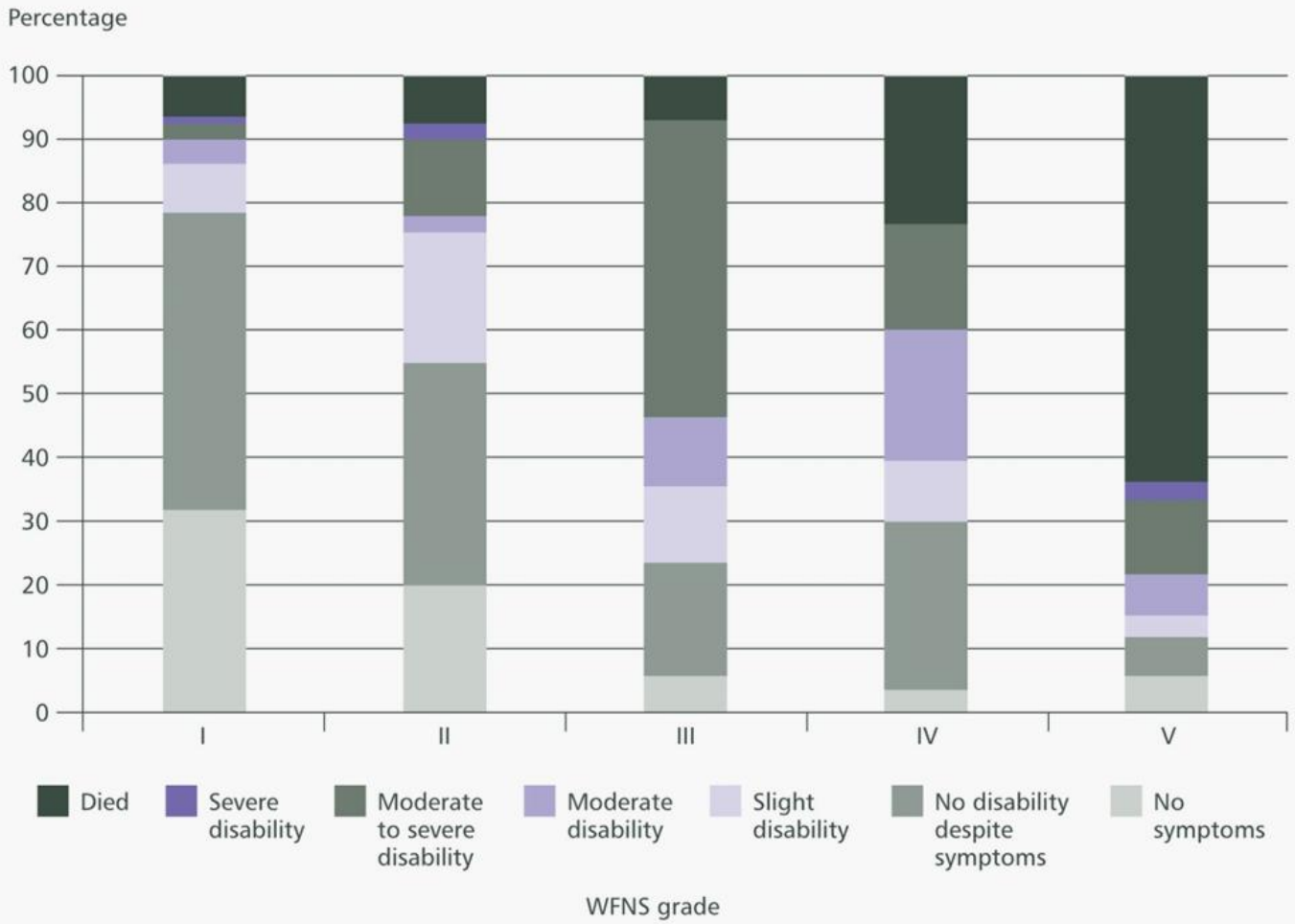


Figure 4.7 Functional outcome at discharge for each WFNS grade prior to intervention

(Tertiary care clinician questionnaire; n=315 (Insufficient data in 29))

<1/4 no symptoms or disability

In-patient Rehabilitation
(Advisors' Form)

Inpatient therapy services	n	%
Physiotherapy	163	62.7
Occupational therapy	127	48.8
Speech & Language therapy	68	26.2
Neuropsychology	33	12.7
None of these	49	18.8

Table 4.47

Require formal assessment and planning

ISAT @ 1y showed 1/3 cognitive impairment

Post-discharge Support for Patients with Symptoms or Disability

Support post-discharge	n	%
Patient support via telephone contact	15	8.8
Neuropsychology referral	21	12.4
Patient issued with information on living post-aSAH	47	27.6
Referral to support organisations	12	7.1
Speech and Language therapy referral	10	5.9
Occupational therapy referral	25	14.7
Physiotherapy referral	24	14.1
Other post-discharge support	26	15.3
Insufficient data	15	8.8

Table 4.49

Advisors: inadequate in 35/164 (21.3%)

Functional Status at Discharge Neuropsychology Support

Functional status	Neuropsychology In-patient	%	Neuropsychology Post-discharge	%	Total
No significant disability despite symptoms	15	16.0	12	12.8	94
Slight disability	5	14.7	3	8.8	34
Moderate disability	2	16.7	2	16.7	12
Moderate to severe disability	4	16.0	3	12.0	26
Severe disability	2	50.0	1	25.0	4
Total	**28**	**16.5**	**21**	**12.4**	**170**

Table 4.50

Good cognitive function = independent living, return to work

Organ Donation

Suitability of patients for organ donation	n	%
Yes	91	70.5
No	38	29.5
Subtotal	**129**	
Unknown	24	
Not answered	2	
Total	**155**	

Table 5.1

50% of UK cadaveric donors = ICH
2012/13: 622/1212

Donation occurred	n
Yes	44
No	43
Subtotal	**87**
Unknown	4
Total	**91**

Table 5.2

Organ Donation
Reasons for No Donation

Reason for lack of donation	n
Not considered by medical staff	11
Refused by next of kin	24
Other	8 *
Total	**43**

Table 5.3

* 1/8 refused by ITU consultant

19/43 = missed opportunities

Audit donation rates
Develop policies to increase

Recommendations - Tertiary Care

- Relevant professional bodies should develop nationally-agreed & audited protocols that include:

  Initial assessment and decision-making (MDT) with documentation
  Informed consent
  Timing of intervention
  Perioperative care
  Management of complications
  Rehabilitation

- Mental capacity of aSAH patients to give their own consent should be reviewed and a consensus document developed

Recommendations
Tertiary Care

- The nationally agreed standard (National Clinical Guideline for Stroke) of securing ruptured aneurysms within 48 hours should be met consistently and comprehensively by the clinicians treating this group of patients. This will require providers to assess the service they deliver and move towards 7 day working
- Sufficient training opportunities for trainees to achieve competence
- Appropriately funded rehabilitation for all patients following an aSAH

Summary: Delays

First Delay

Delay	Overall	
General practitioner	32	20%
Paramedical service	6	
Previous presentation to secondary care	17	
Initial assessment in secondary care	18	44%
Delayed diagnosis in secondary care	18	
Delayed request/performing/interpreting CT scan in secondary care	11	
Delay in referral/finding contact at NSC	15	
Delay in acceptance by NSC	18	36%
Delay in transfer to NSC	19	
Delay in consultant review in NSC	12	
Delay in treatment planning	6	
Delay in performing procedure	10	
Delay in access to level 3 care post-procedure	2	
Total	**184**	

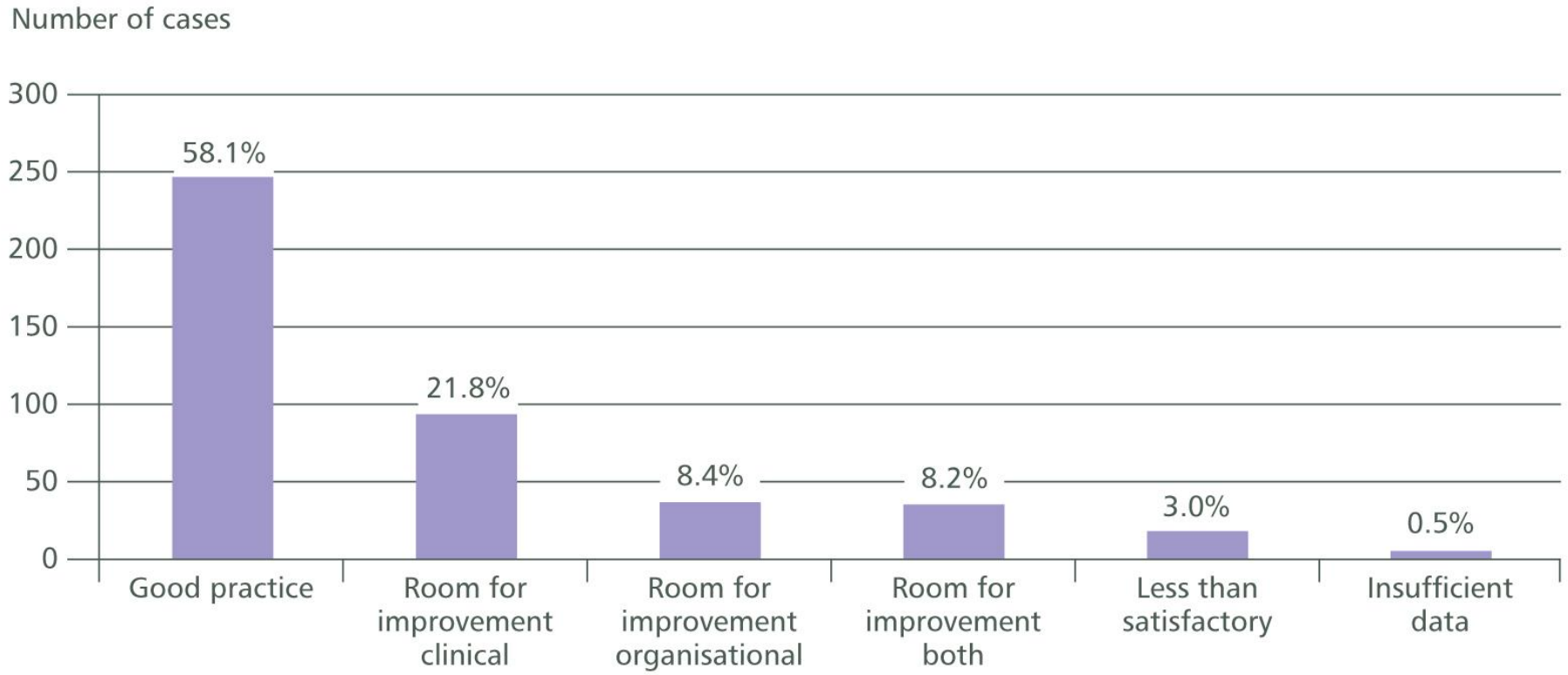
Table 6.1

184 patients suffered a delay

68 patients had deficiencies in care that affected outcome

Primary 25
Secondary 33
Tertiary 10

Overall Quality of Care
Secondary & Tertiary Hospitals

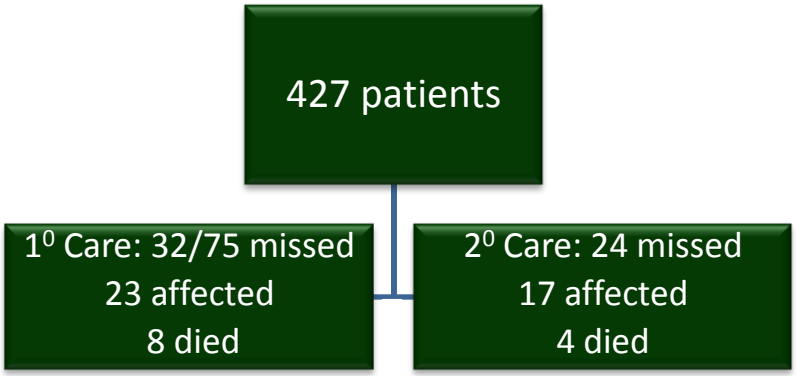


2^0 care: 68.5%
3^0 care: 53.8%

2^0 care: 1.6%
3^0 care: 11.2%

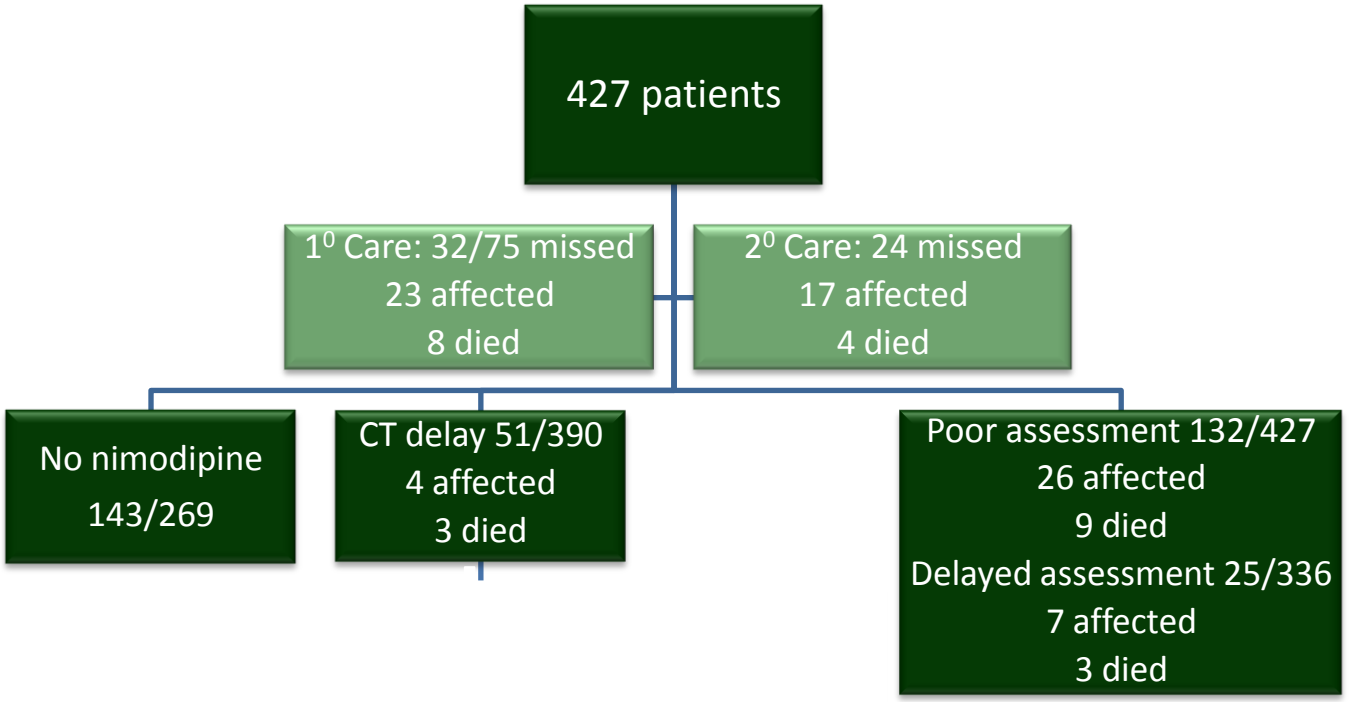
Figure 6.1 Overall quality of care (n=427)
(Advisor assessment form)

Summary & Key Recommendations



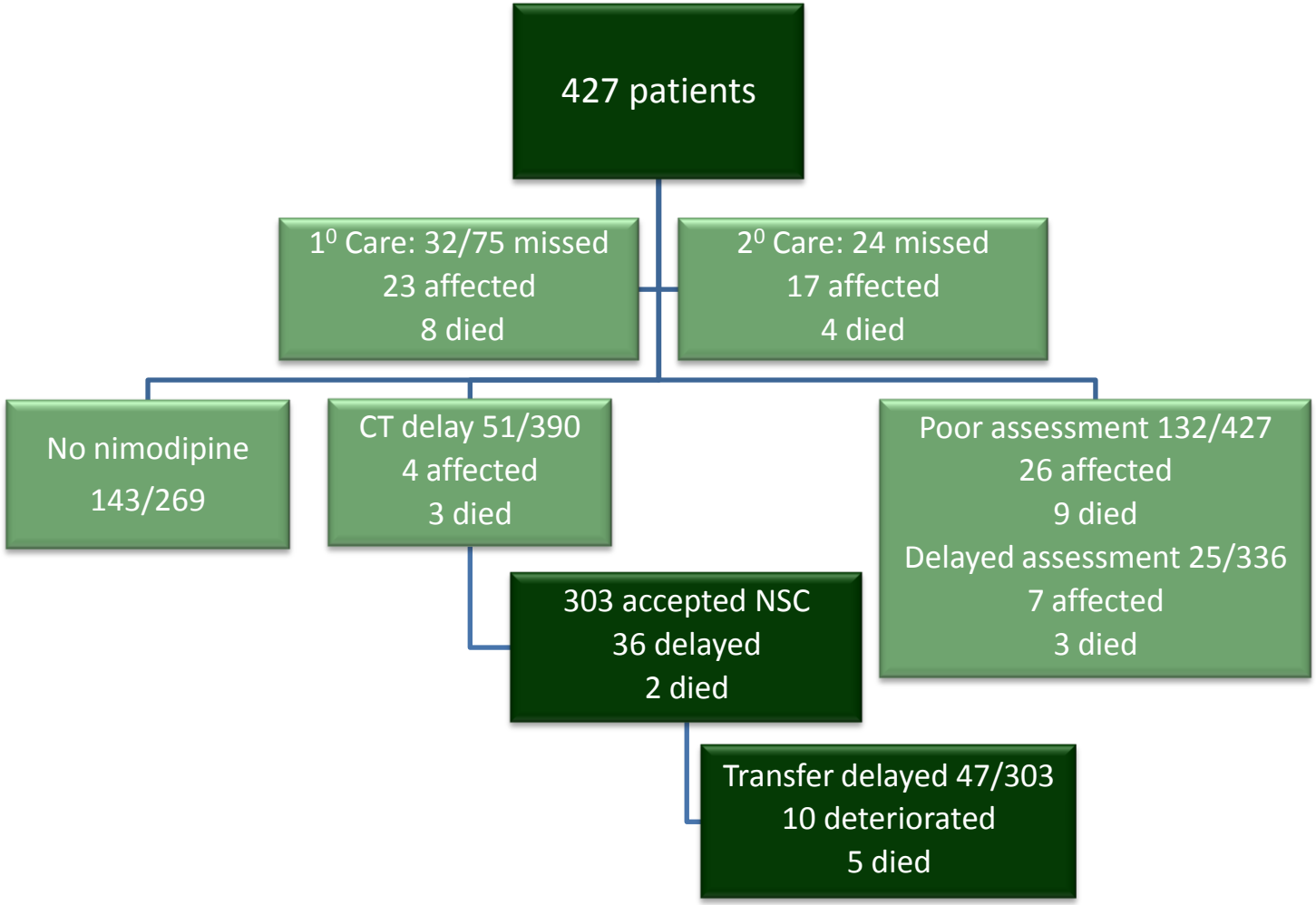
Education & protocols for the management of severe headache

Summary & Key Recommendations



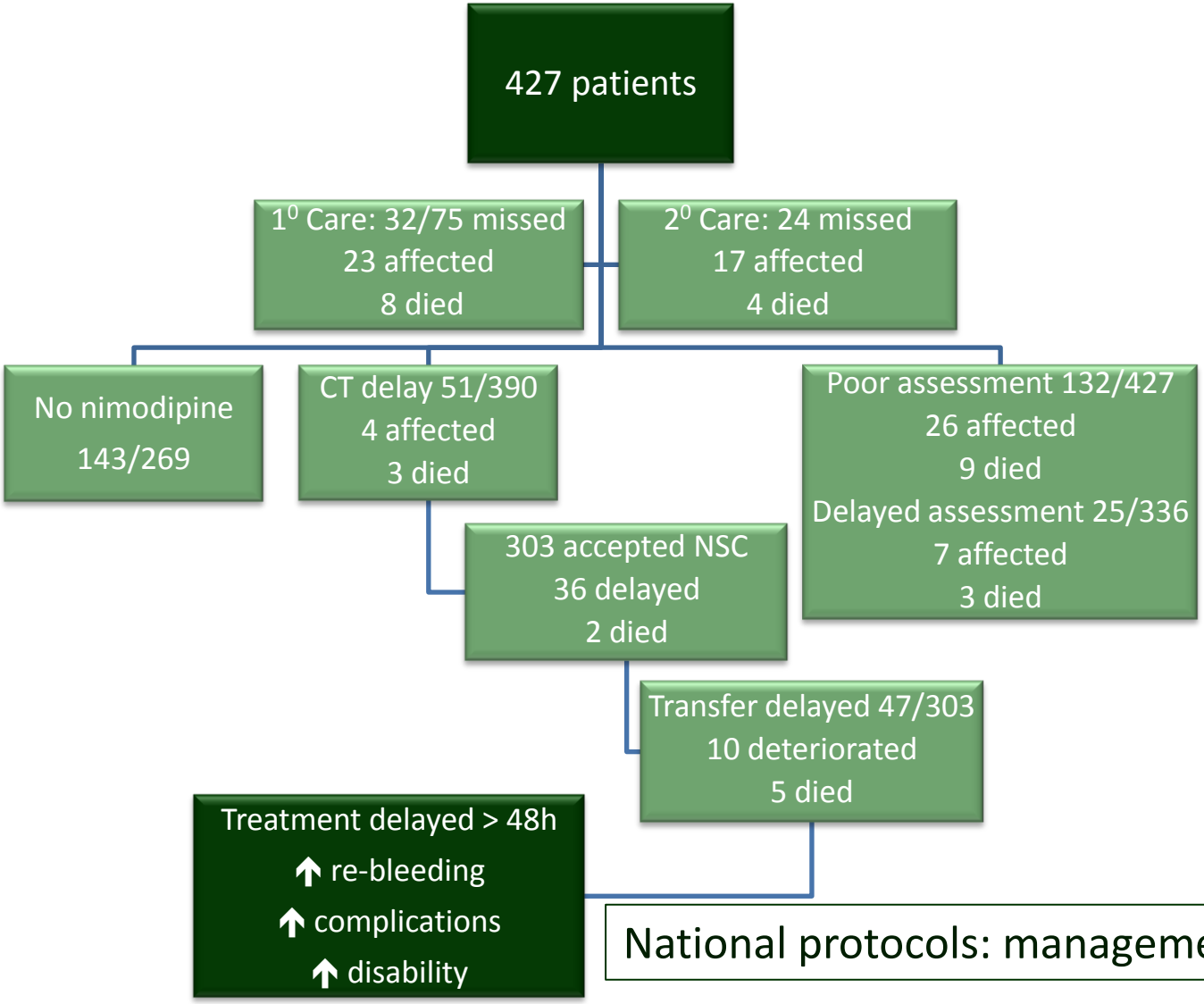
Standard protocols for networks: management in secondary care

Summary & Key Recommendations



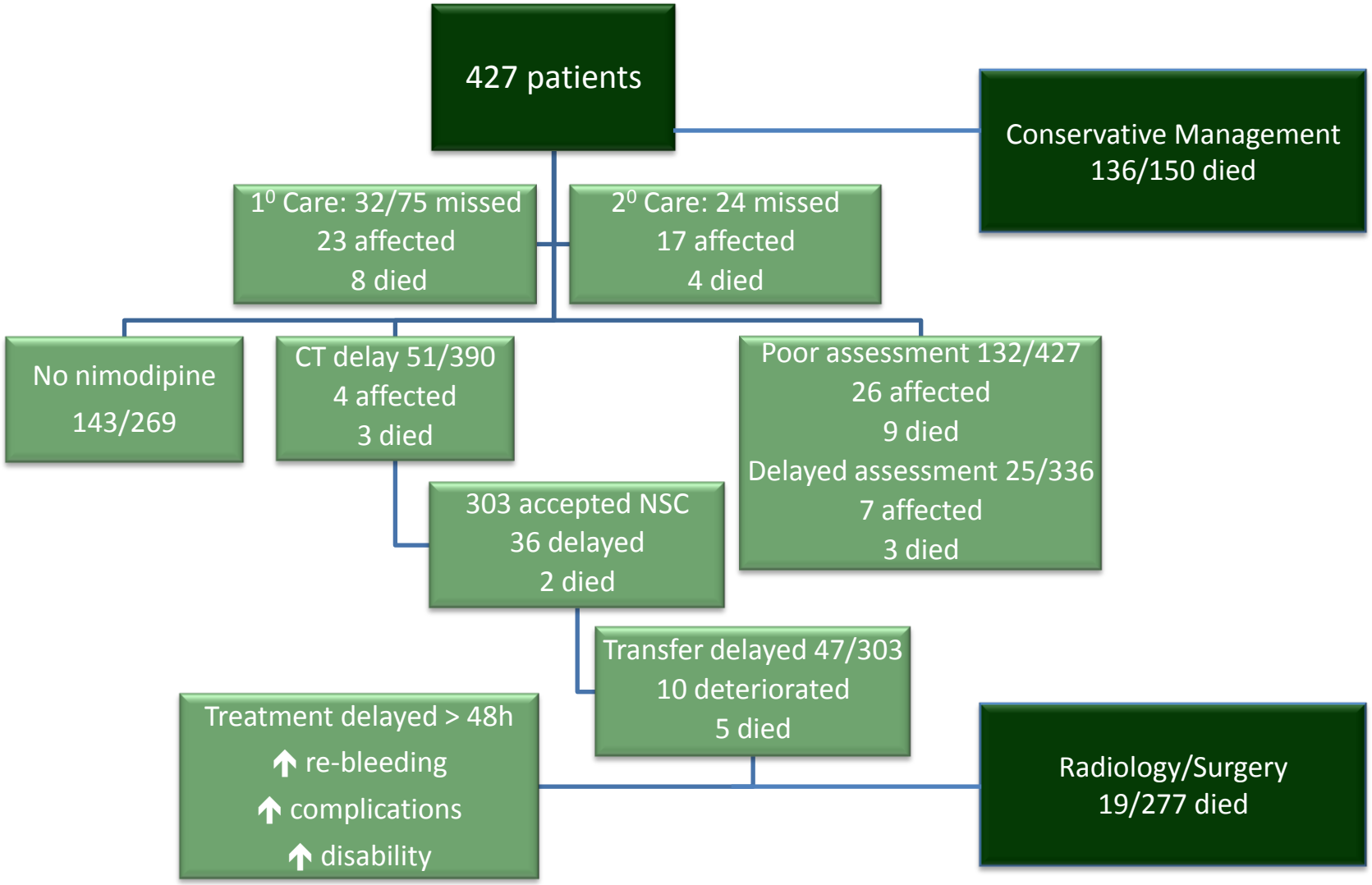
Formal networks and protocols for transfer

Summary & Key Recommendations



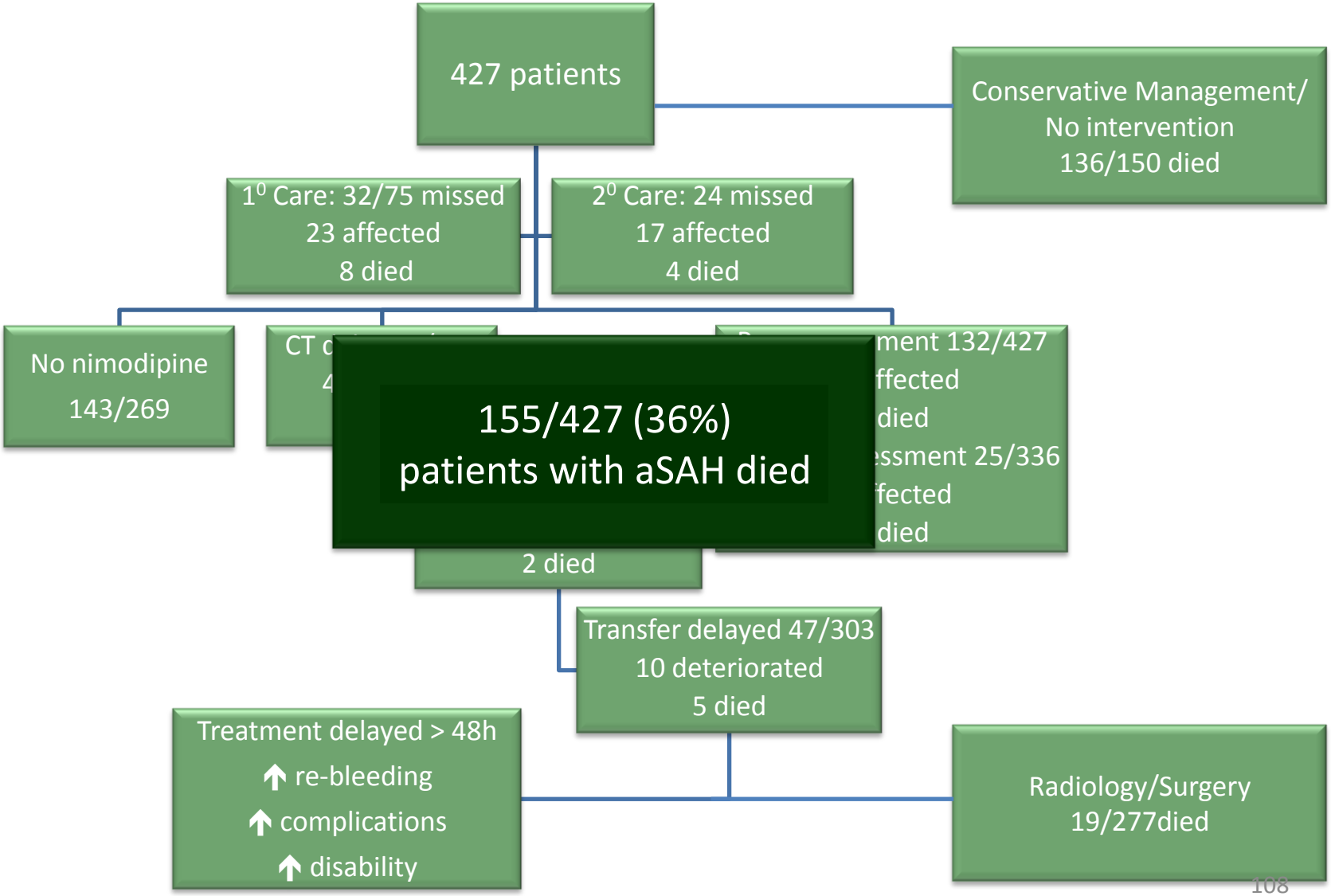
National protocols: management tertiary care

Summary & Key Recommendations



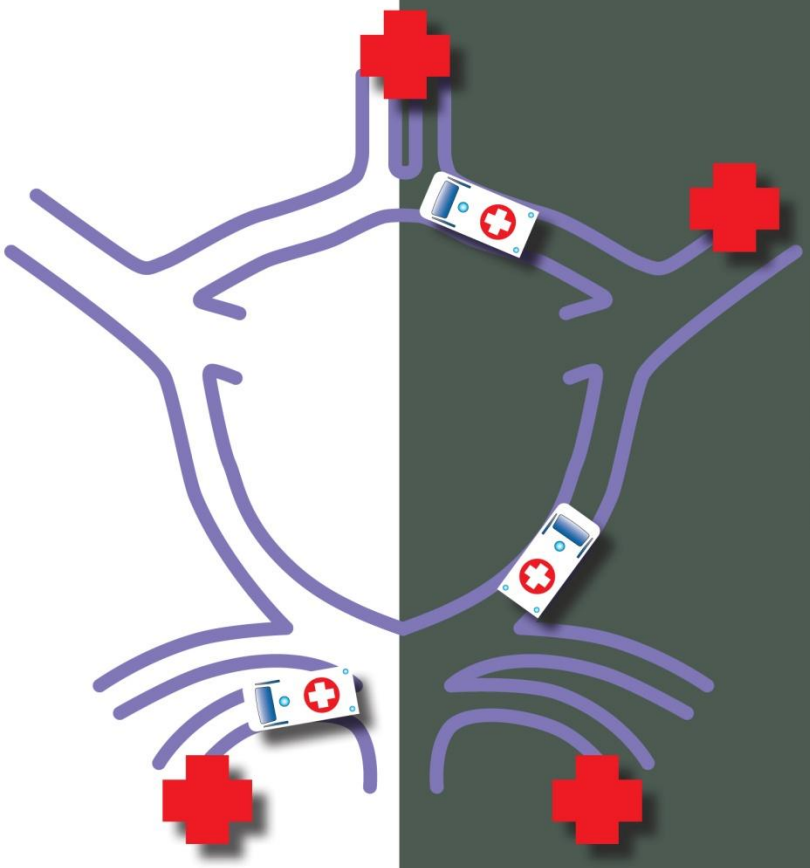
238/427 patients survived, many requiring rehabilitation

Summary & Key Recommendations



Thank you
www.ncepod.org.uk

National Confidential Enquiry into Patient Outcome and Death



Managing the Flow?

A review of the care received by patients who were diagnosed with an aneurysmal subarachnoid haemorrhage

NCEPOD