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N/A = not applicable

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PATIENT'S NAME: [redacted] HOSPITAL NO: [redacted]

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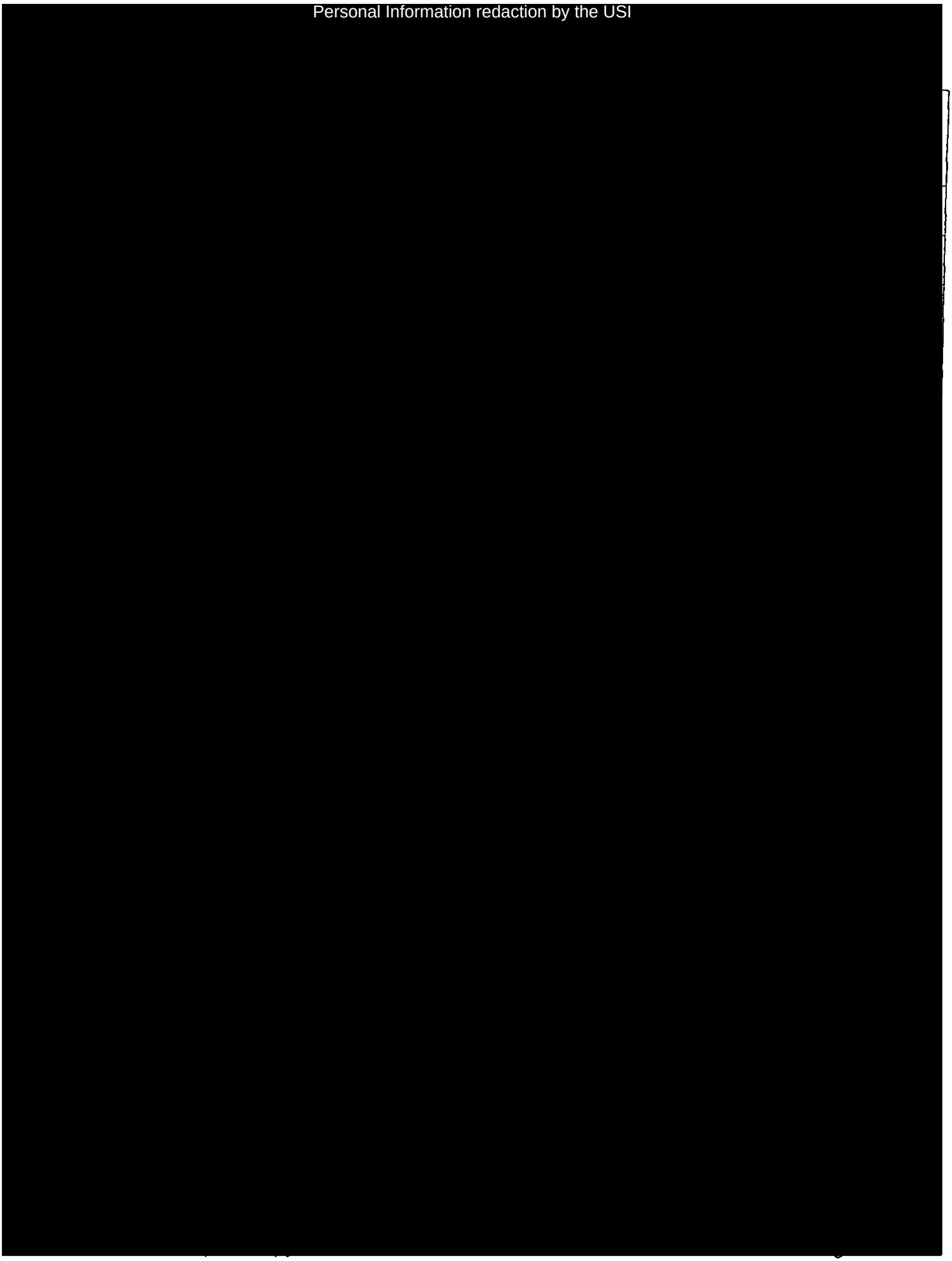

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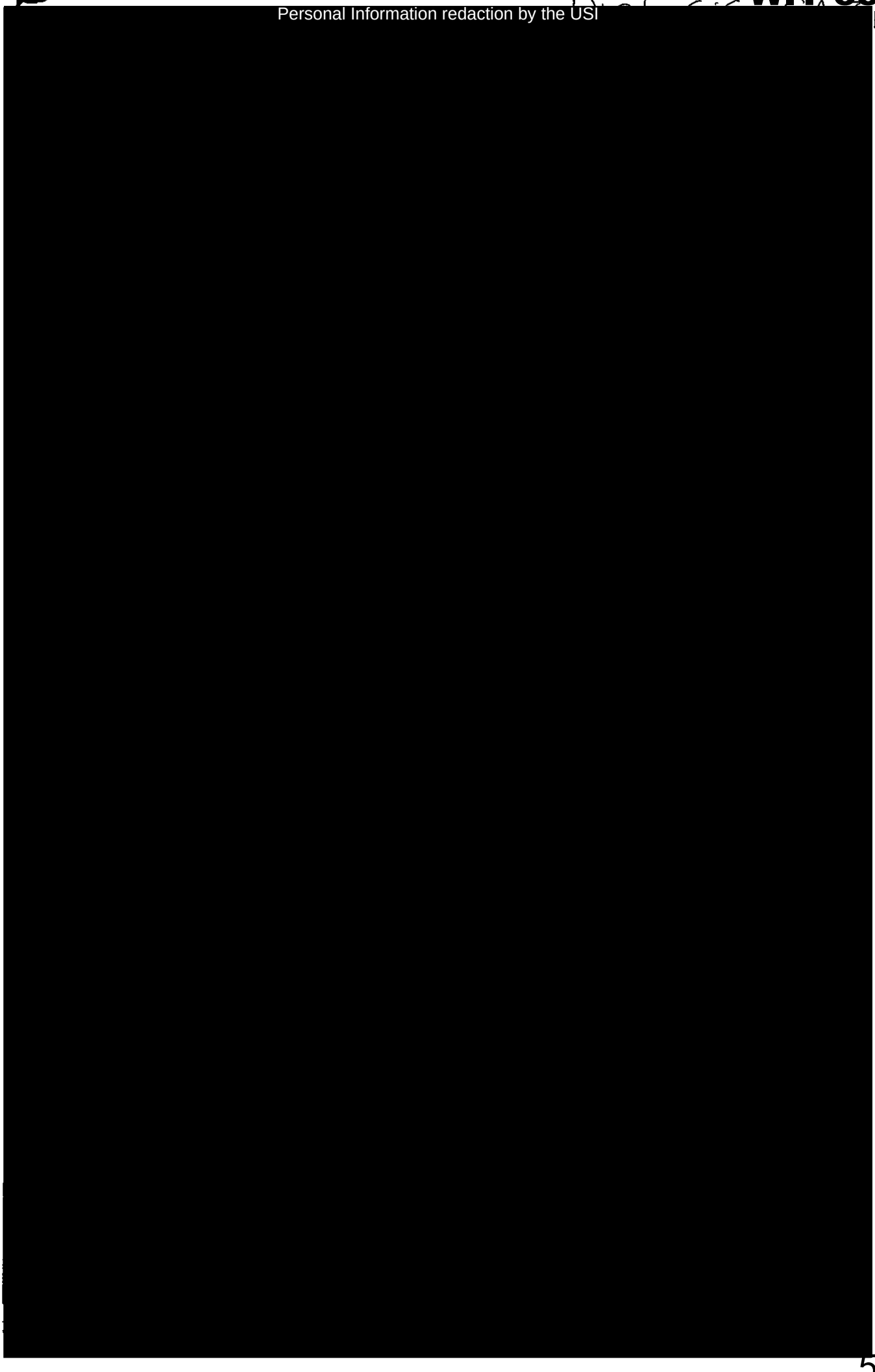

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WIT-55359

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WIT-55361

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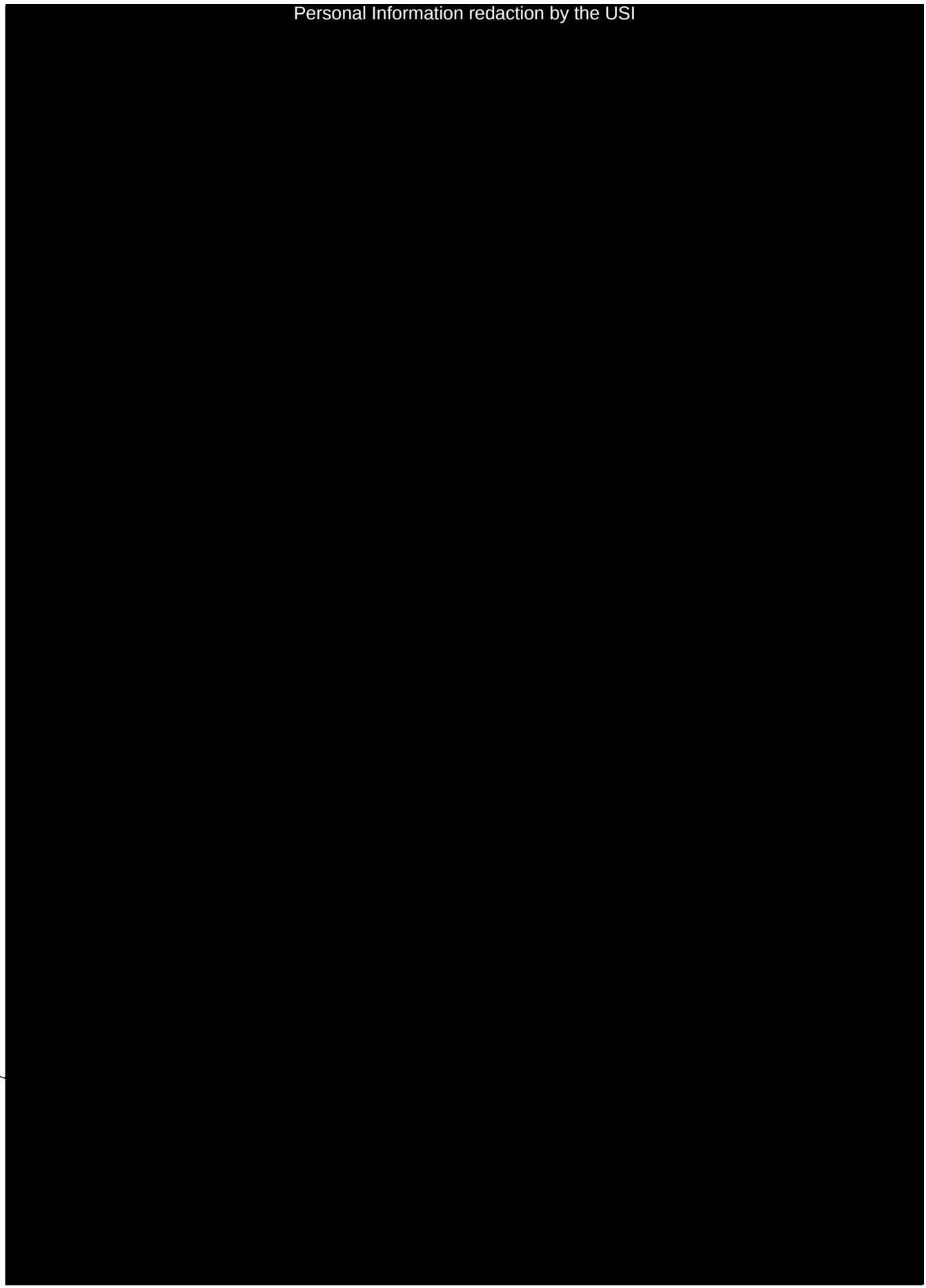

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N/A = not applicable

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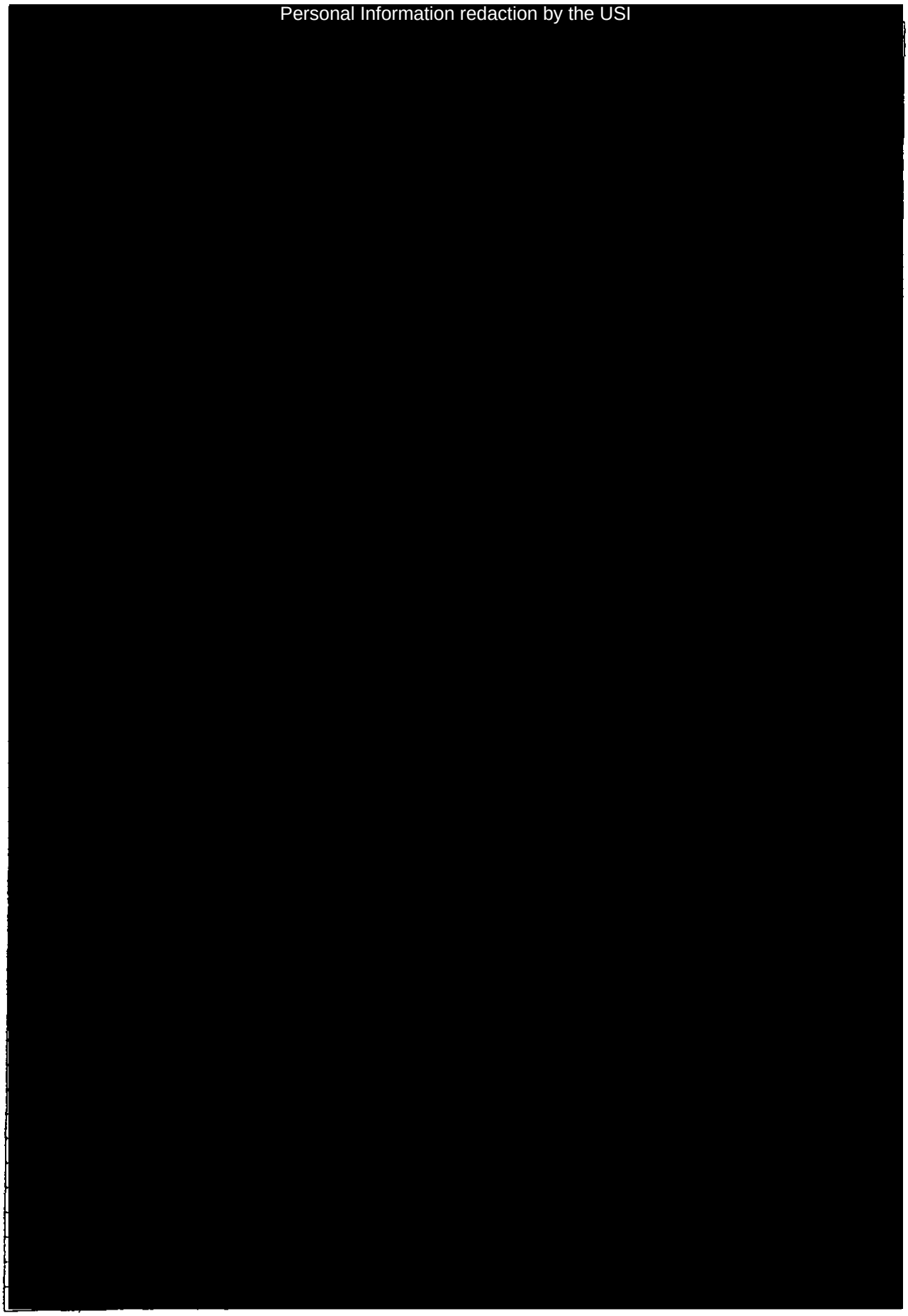
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Communication

(relevant telephone calls, face to face communication with patient/relatives/carers)

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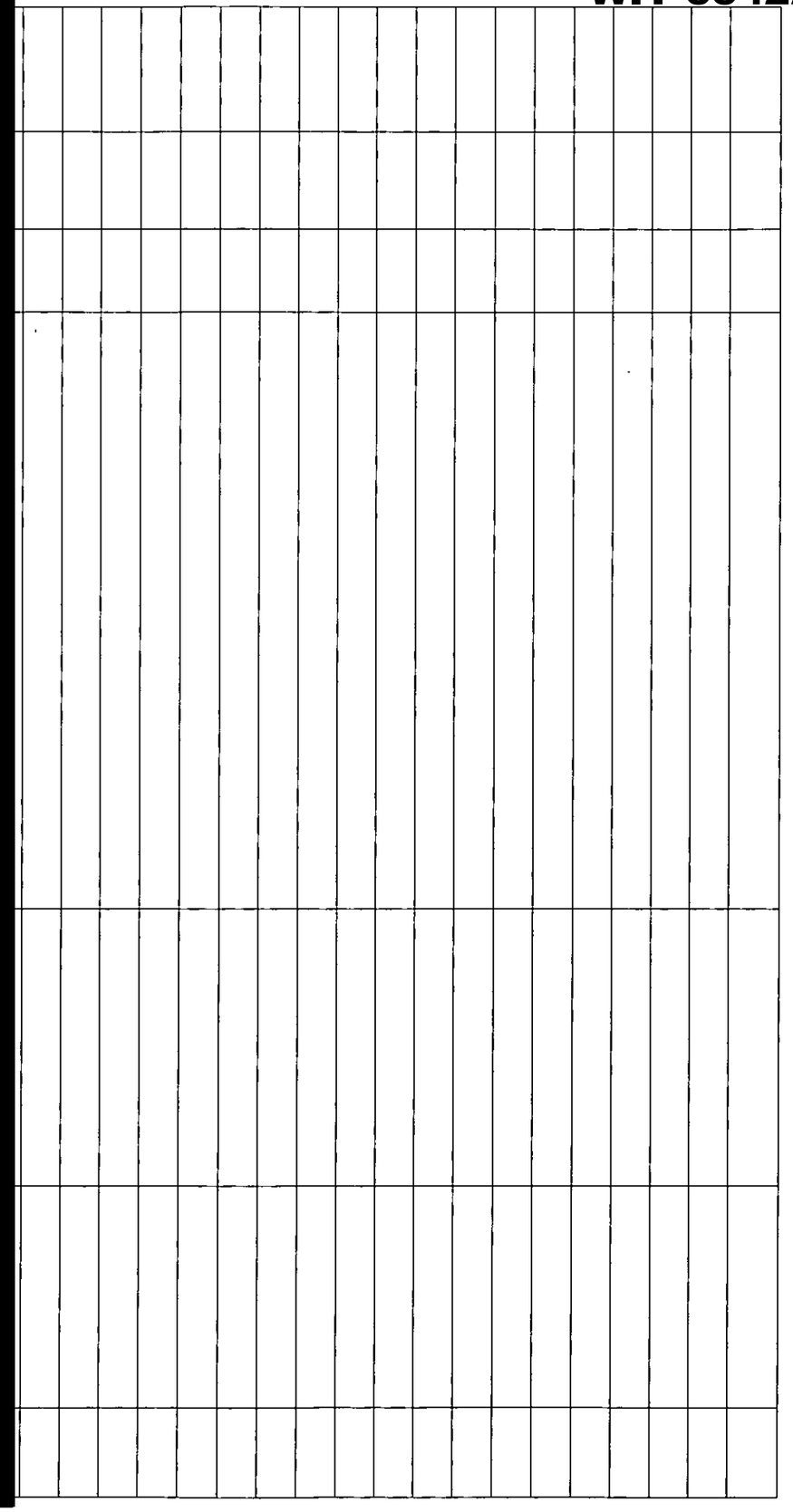

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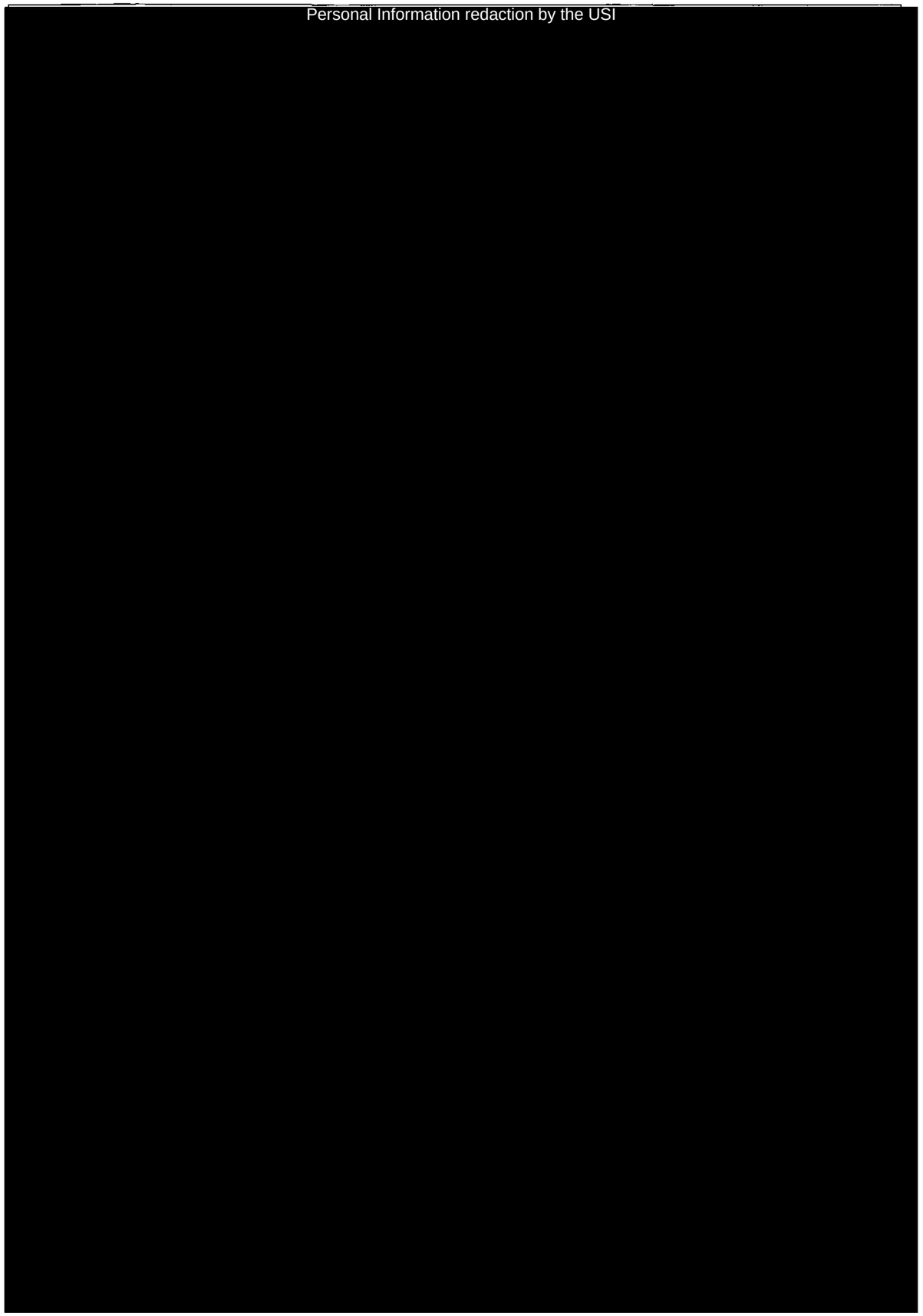

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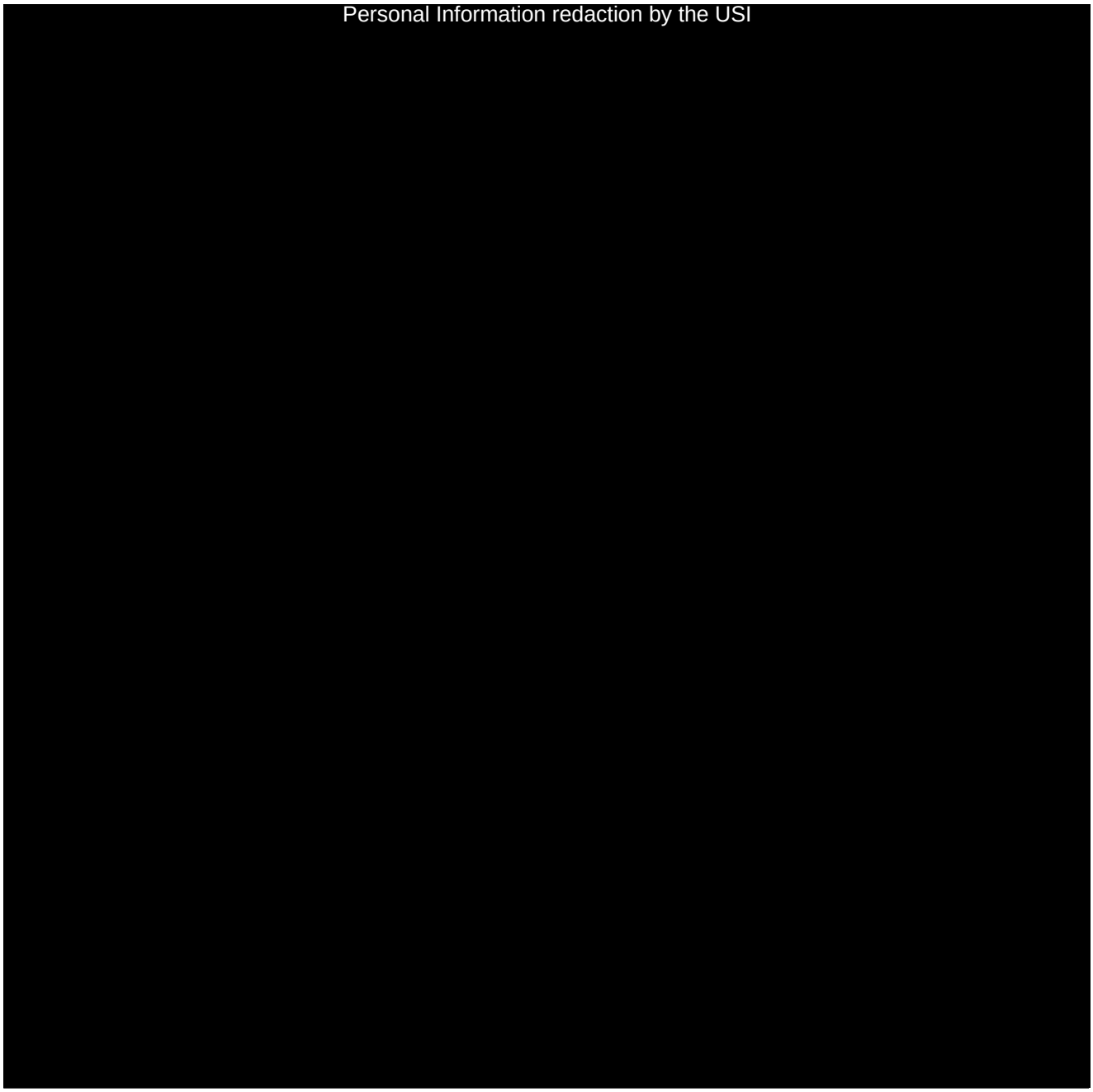
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NSV Code CBO4105

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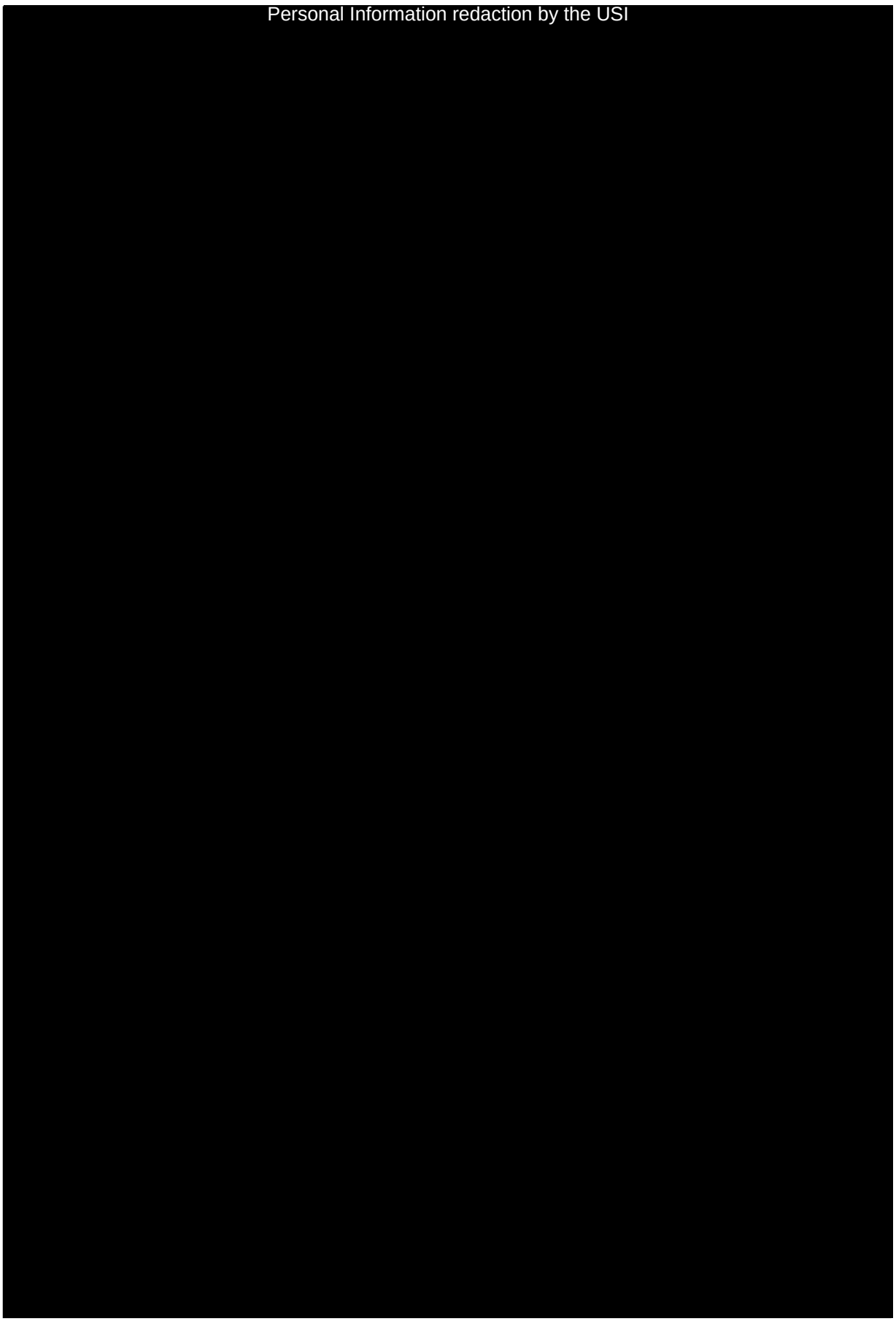
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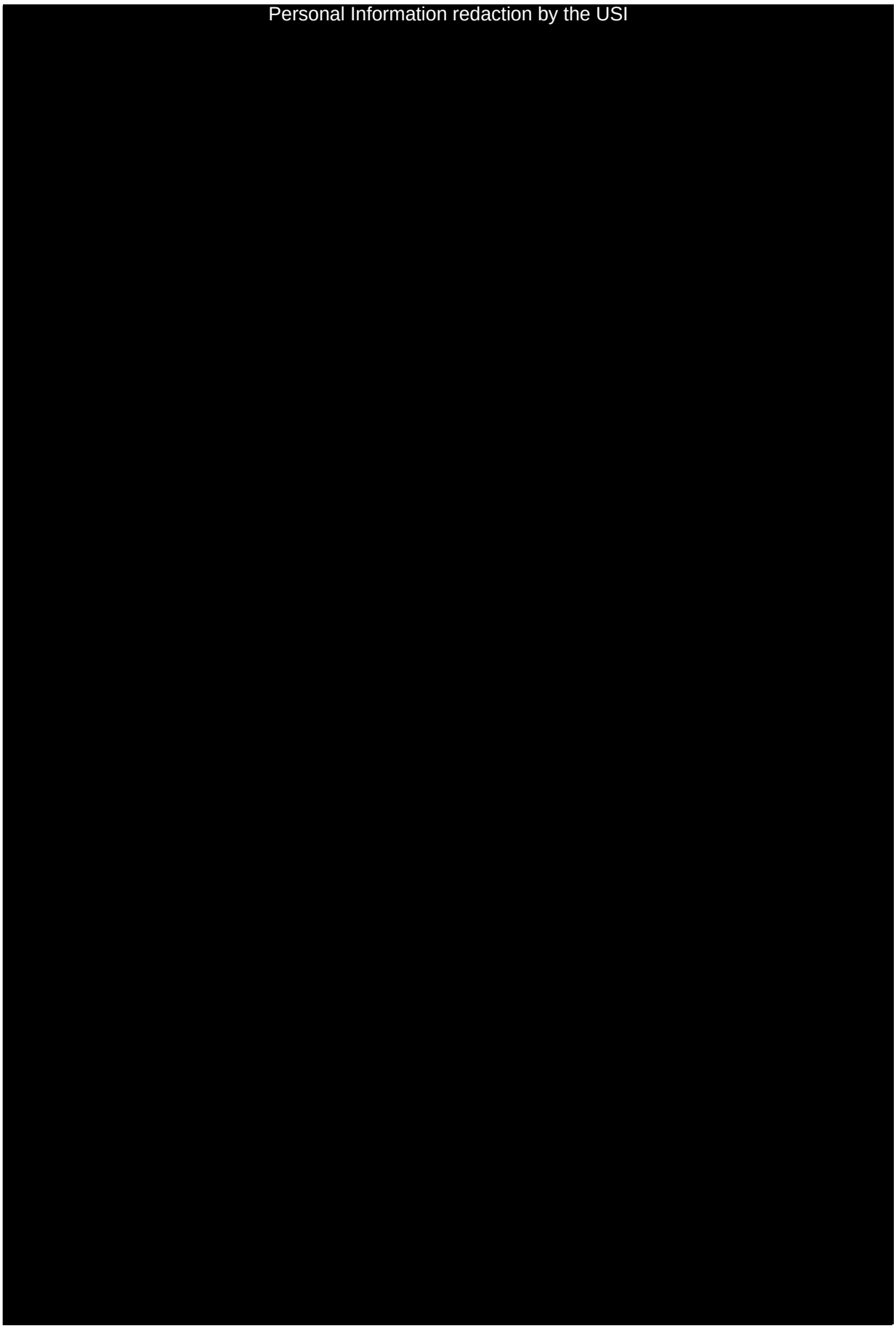

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Trimprint, Armagh

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** Include daily cannulae flush volumes

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Include daily cannulae flush volumes

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Corrigan, Martina

From: Hainey, Lynne <Personal Information redacted by the USI>
Sent: 12 June 2018 16:05
To: Haynes, Mark
Subject: Confidential - Medical Negligence Claim - Patient 108
Attachments: Patient 108_CRAIGAVON AREA HOSP NOTES_Personal Information redacted by the USI.pdf; file.pdf; WITNESS STATEMENTS MN & PLEL - FAQ.pdf; file.pdf

Dear Mr Haynes
My apologies for sending you another e-mail, but I note that there is a second case that Lorraine Magill , Litigation Case Manager has had some difficulty in obtaining a response from Mr O'Brien. The information required in this case is a witness statement detailing Mr O'Brien's involvement (all information required to enable him to do this is as per the attached).

I would be most grateful for your assistance with this matter
As before, should you have any queries, please do not hesitate to contact me

Regards

Lynne

Lynne Hainey
Litigation Manager
Litigation Department,
1st Floor, Nurse's Home
Daisy Hill Hospital
Newry

Tel No: Personal Information redacted by the USI

Personal Information redacted by the USI

Please consider the environment before printing this email

From: Magill, Lorraine [mailto:Personal Information redacted by the USI]
Sent: 15 January 2018 10:05
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 108

Mr O'Brien
Can you please contact me to discuss this case?

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI

Personal Information redacted by the USI

From: Magill, Lorraine [mailto: Personal Information redacted by the USI]
Sent: 09 October 2017 14:30
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 108

Dr O'Brien
I refer to the above named case, to my email below and note I have not received a response to same. Your urgent attention would be appreciated.
Regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI

Personal Information redacted by the USI

From: Magill, Lorraine Personal Information redacted by the USI
Sent: 20 June 2017 08:33
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: FW: Patient 108

Mr O'Brien
I refer to my email below and note I have not received your response to date.
Can you please provide your report as soon as possible?
Regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI

Personal Information redacted by the USI

From: Magill, Lorraine
Sent: 23 May 2017 12:02
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 108

Dr O'Brien

The Trust has received the attached Letter of Claim from Personal Information redacted by the USI dated Personal Information redacted by the USI written on behalf of their client Patient 108 date of birth: Personal Information redacted by the USI

Brief over view of allegations:

Personal Information redacted by the USI

The Trust's legal advisors, the Directorate of Legal Services (DLS), who are preparing the Trust's response to the allegations, have requested an involvement report from the Clinicians / medical staff who were involved in the treatment and care of the Plaintiff prior to, during and after the alleged incident.

Please find attached the following documents:

1. Copy of Personal Information redacted by the USI notes

2. Guidance / FAQ on preparing involvement reports/witness statements
3. Plaintiff's Letter of Claim

I would be grateful if you could prepare your involvement report and forward it to me on or before **Tuesday 13th June 2017**. If you have any queries regarding the preparation of this report please let me know. I will be your point of contact for this case with overall management residing with Karen Wasson, Acting Litigation Manager.

Please note that if you require the original chart / records, you must request this from Medical Records – the Litigation Department do not hold the original chart / records at this point in the management of the case.

If you have any queries, please do not hesitate to contact me. Thank you for your assistance with this matter.

Regards

Lorraine Magill | Litigation Services Co-ordinator
Southern Health & Social Care Trust | Litigation Department |
1st Floor Nurses Home | Daisy Hill Hospital | Newry | BT35 8DE |
T: Personal Information redacted by the USI | E: Personal Information redacted by the USI

Personal Information redacted by the USI

Southern Health and Social Care Trust

Quality Care - for you, with you

LPP Information redacted by the USI

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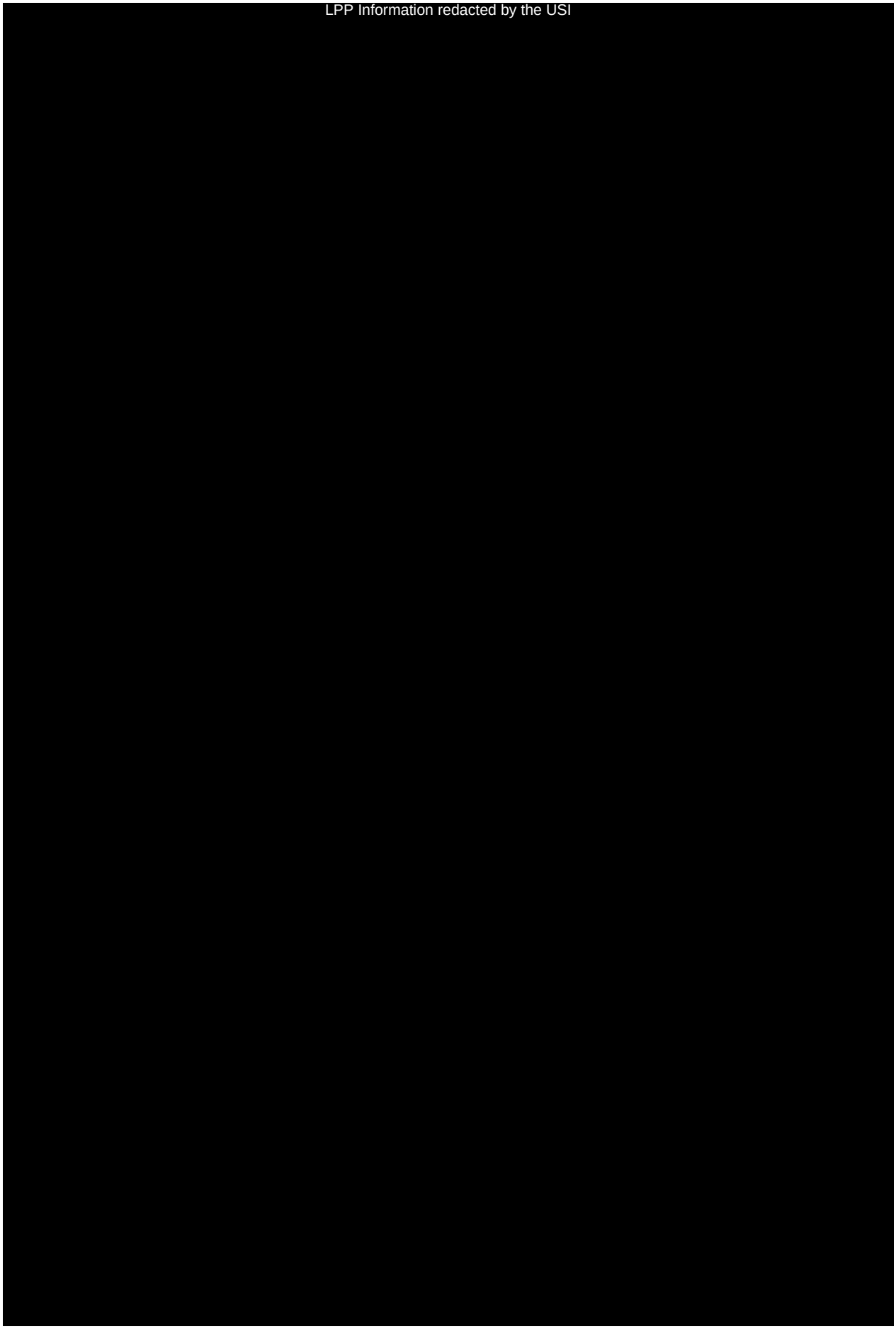
Southern Health and Social Care Trust

Quality Care - for you, with you

[redacted]

LPP Information redacted by the USI



Southern Health and Social Care Trust

Quality Care - for you, with you

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Southern Health and Social Care Trust

Quality Care - for you, with you

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Southern Health and Social Care Trust

Quality Care - for you, with you

[redacted]

LPP Information redacted by the USI

Southern Health and Social Care Trust

Quality Care - for you, with you

LPP Information redacted by the USI

[redacted]

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Our Ref: Personal Information redacted by the USI Your Ref:

Date:

The Southern Health and Social Care Trust
Southern College of Nursing
Craigavon Area Hospital
68 Lurgan Road
Portadown
BT63 5QQ

Dear Sirs,

Personal Information redacted by the USI

Re: Our Client: Patient 108 Date of Birth: Personal Information redacted by the USI

Address: Personal Information redacted by the USI

DOB- Personal Information redacted by the USI NI- Personal Information redacted by the USI

Personal Information redacted by the USI

We consider that this correspondence provides sufficient information to enable you to commence investigations and to put an initial valuation upon the claim. Finally you will be aware that the protocol makes clear that this correspondence is not intended to have the formal status of a pleading and, therefore, we reserve the right to provide further information in due course

Yours faithfully,

Personal Information redacted by the USI

Magill, Lorraine

From: Magill, Lorraine
Sent: 01 May 2018 13:13
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 108
Attachments: Patient 108 CRAIGAVON AREA HOSP NOTES_ Personal Information redacted by the USI pdf; file.pdf; WITNESS STATEMENTS MN & PLEL - FAQ.pdf

Mr O'Brien
I refer to the above named case and as discussed today, please see below my request for a report on this case, as soon as possible.
I look forward to your response.

Kind regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI
Hours of Work: Monday – Friday 8.00 am – 4.00 pm

Personal Information redacted by the USI

From: Magill, Lorraine
Sent: 23 May 2017 12:02
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 108

Dr O'Brien

The Trust has received the attached Letter of Claim from Personal Information redacted by the USI dated Personal Information redacted by the USI written on behalf of their client Patient 108 date of birth: Personal Information redacted by the USI.

Brief over view of allegations:

Personal Information redacted by the USI

The Trust's legal advisors, the Directorate of Legal Services (DLS), who are preparing the Trust's response to the allegations, have requested an involvement report from the Clinicians / medical staff who were involved in the treatment and care of the Plaintiff prior to, during and after the alleged incident.

Please find attached the following documents:

1. Copy of Personal Information redacted by the USI notes
2. Guidance / FAQ on preparing involvement reports/witness statements
3. Plaintiff's Letter of Claim

I would be grateful if you could prepare your involvement report and forward it to me on or before **Tuesday 13th June 2017**. If you have any queries regarding the preparation of this report please let me know. I will be your point of contact for this case with overall management residing with Karen Wasson, Acting Litigation Manager.

Corrigan, Martina

From: Hainey, Lynne < Personal Information redacted by the USI >
Sent: 12 June 2018 15:45
To: Haynes, Mark
Subject: Confidential - Medical Negligence Claim - Patient 109
Attachments: Agreed Minute Urology experts meeting.pdf; Patient 109 (1.27 MB); Patient 109 (3.28 MB)

Dear Dr Haynes

I write in relation to the above claim for a Patient 109, and wonder if you could assist with the following outstanding information as this case is listed for hearing on [redacted] Personal Information redacted by the USI. The information that is outstanding is from Mr Aiden O'Brien, and Lorraine Magill from Litigation's attempts at obtaining same from Mr O'Brien have not been successful to date.

Lorraine has referred this to me and advises me that the information outstanding is as follows

- any comment Mr O'Brien may have on the attached Joint Urology minutes - sent on 31st August 2017(see below)
- confirmation from Mr O'Brien re holding the hearing dates, which is [redacted] Personal Information redacted by the USI for a 3 day action – sent on 23rd November 2017 (see below)
- Any comments that Mr O'Brien may have on the attached from Dr Personal Information redacted by the USI, Consultant Personal Information redacted by the USI, Undated
- Any comments that Mr O'Brien may have on the attached reports:-
  - Medico-legal Report of Mr Personal Information redacted by the USI, dated Personal Information redacted by the USI;
  - Medico-legal Report of Mr Personal Information redacted by the USI, dated Personal Information redacted by the USI;
  - Supplementary Medico-legal Report of Personal Information redacted by the USI, dated Personal Information redacted by the USI
  - Plaintiff's Replies to Notice for Further and Better Particulars – Personal information redacted by USI.

I would be most grateful for any assistance that you can provide in obtaining Mr O'Brien's response to the above. If there are no comments, I would be most grateful if Mr O'Brien could confirm same so that we can inform our solicitors as soon as possible. If there is anything further that we in Litigation can do to assist with this, please do not hesitate to contact me.

Should you have any queries, please do not hesitate to contact either Lorraine or I

Many thanks

Lynne

Lynne Hainey
Litigation Manager
Litigation Department,
1st Floor, Nurse's Home
Daisy Hill Hospital
Newry

Tel No: Personal Information redacted by the USI

Personal Information redacted by the USI

Please consider the environment before printing this email

From: Magill, Lorraine
Sent: 01 May 2018 13:17
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 109

Mr O'Brien
I refer to our conversation today, please confirm your acceptance of the hearing date noted below and also advise if you have any comments to make on the Urology expert minutes attached.
Regards

Kind regards

Lorraine Magill | Litigation Services Co-ordinator
Southern Health & Social Care Trust | Litigation Department |
1st Floor Nurses Home | Daisy Hill Hospital | Newry | BT35 8DR |
T: Personal Information redacted by the USI | E: Personal Information redacted by the USI
Hours of Work: Monday – Friday 8.00 am – 4.00 pm

Personal Information redacted by the USI

From: Magill, Lorraine
Sent: 23 November 2017 12:12
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 109

Mr O'Brien
I refer to the above named case and to my previous email and confirm the court has listed this case for final hearing on the [redacted] Personal Information redacted by the USI for a 3 day action.
I would appreciate if you would confirm your attendance, by reply.
Regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI
Personal Information redacted by the USI

From: Magill, Lorraine
Sent: 31 August 2017 15:59
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 109

Mr O'Brien
I refer to the above named case and to the impending hearing date - Personal information [redacted] The Directorate of Legal Services have asked this office to share the attached Expert minutes with you for your consideration .

Please advise if you have any comments to make regarding the minutes? I would appreciate your reply by **Thursday 7th September 2017**.

Regards

Lorraine Magill | Litigation Services Co-ordinator

T: Personal Information redacted by the USI Ext: Personal Information redaction by the USI

Personal Information redacted by the USI

Patient 109 Personal Information

JOINT REPORT ON Patient 109

MEETING OF UROLOGICAL EXPERTS

Expert for The Defendant	Expert for The Claimant
Personal Information redacted by the USI Personal Information redacted by the USI Personal Information redacted by the USI	Personal Information redacted by the USI Personal Information redacted by the USI Personal Information redacted by the USI
Instructing Solicitors Personal Information redacted by the USI T: F: E: REF: Personal Information redacted by the USI	**Instructing Solicitors** Personal Information redacted by the USI REF: Personal Information redacted by the USI

The report has been prepared to inform the court without bias. The experts believe the answers to be true. The report represents the agreed opinion of both experts unless otherwise indicated.

Legal Statement

1. I understand that my duty in providing written reports and giving evidence is to help the Court, and that this duty overrides any obligation to the party by whom I am engaged or the person who has paid or is liable to pay me. I confirm that I have complied and will continue to comply with my duty.

2. I confirm that I have not entered into any arrangement where the amount or payment of my fees is in any way dependent on the outcome of the case.

3. I know of no conflict of interest of any kind, other than any which I have disclosed in my report.

4. I do not consider that any interest which I have disclosed affects my suitability as an expert witness on any issues on which I have given evidence.

5. I will advise the party by whom I am instructed if, between the date of my report and the trial, there is any change in circumstances which affect my answers to points 3 and 4 above.

6. I have shown the sources of all information I have used.

7. I have exercised reasonable care and skill in order to be accurate and complete in preparing this report.

8. I have endeavoured to include in my report those matters, of which I have knowledge or of which I have been made aware, that might adversely affect the validity of my opinion. I have clearly stated any qualifications to my opinion.

9. I have not, without forming an independent view, included or excluded anything which has been suggested to me by others, including my instructing lawyers.

10. I will notify those instructing me immediately and confirm in writing if, for any reason, my existing report requires any correction or qualification.

11. I understand that;
    My report will form the evidence to be given under oath or affirmation;
    Questions may be put to me in writing for the purposes of clarifying my report and that my answers shall be treated as part of my report and covered by my statement of truth;

12. The court may at any stage direct a discussion to take place between experts for the purpose of identifying and discussing the expert issues in the proceedings, where possible reaching an agreed opinion on those issues and identifying what action, if any, may be taken to resolve any of the outstanding issues between the parties;

13. The court may direct that following a discussion between the experts that a statement should be prepared showing those issues which are agreed, and those issues which are not agreed, together with a summary of the reasons for disagreeing;

14. I may be required to attend court to be cross-examined on my report by a cross-examiner assisted by an expert;

15. I am likely to be the subject of public adverse criticism by the judge if the Court concludes that I have not taken reasonable care in trying to meet the standards set out above.

16. I have read Part 35 of the Civil Procedure Rules, the accompanying practice direction and the Guidance for the instruction of experts in civil claims and I have complied with their requirements.

17. I am aware of the practice direction on pre-action conduct. I have acted in accordance with the Code of Practice for Experts.

STATEMENT OF TRUTH

18. I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.

Personal Information redacted by the USI

Personal Information redacted by the USI

Date.....

Personal Information redacted by the USI

Personal Information redacted by the USI

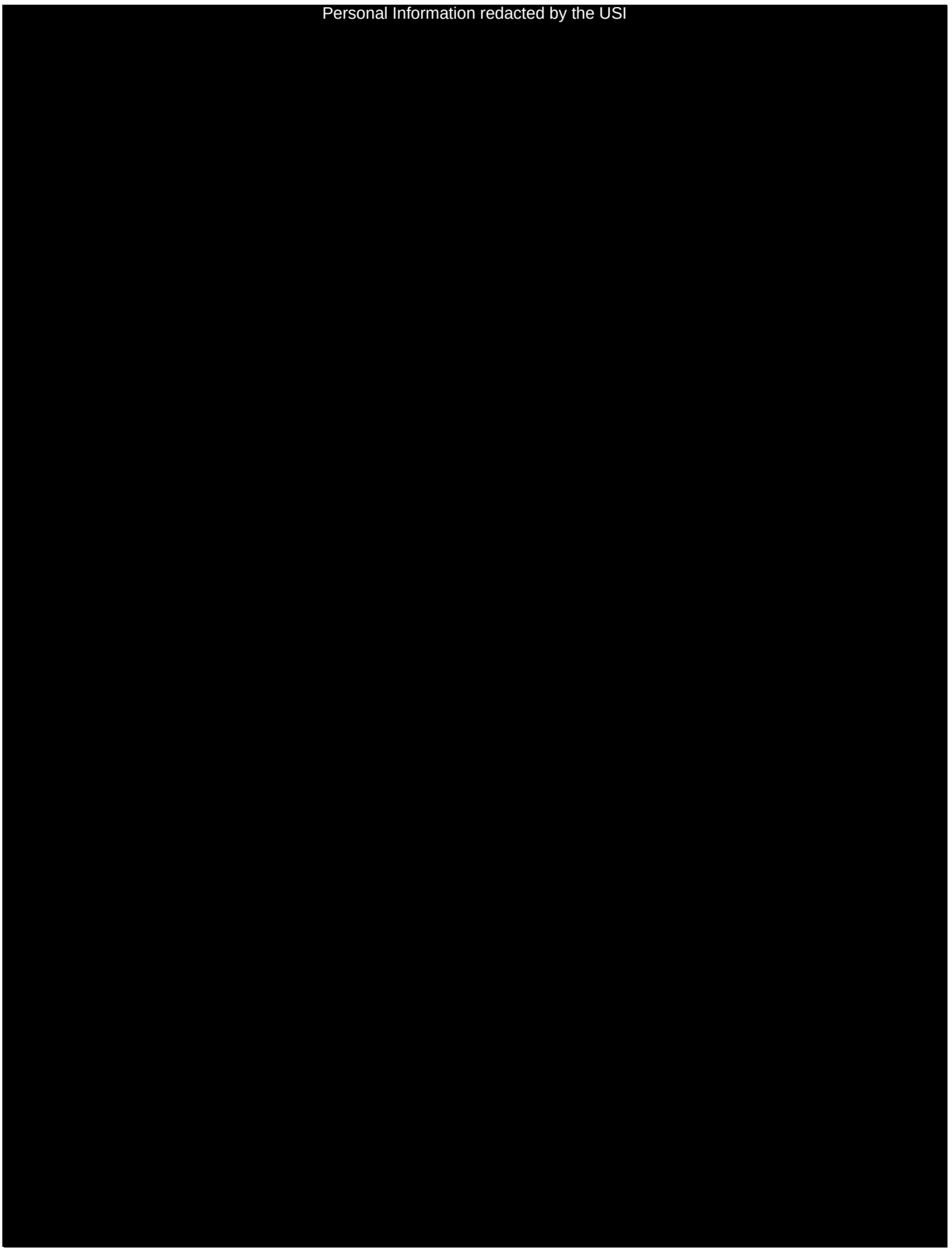
Date.....

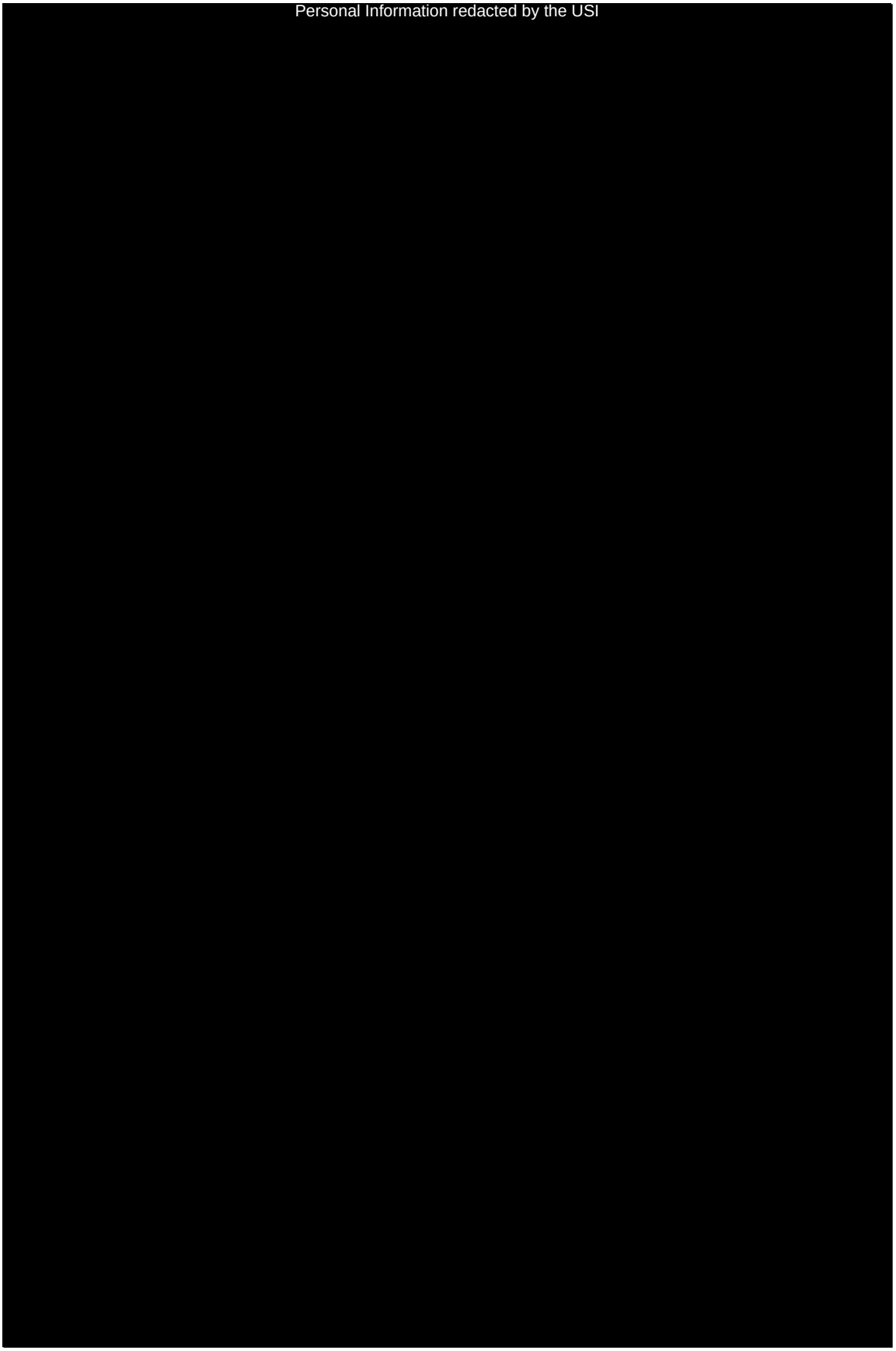
Patient 109 Personal Information redacted by the USI

QUESTIONS FOR THE EXPERTS

Personal Information redacted by the USI

Patient 109 Personal Information redacted by the

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Patient 109 Personal Information redacted by the USI

Personal Information redacted by the USI

[redacted]

Personal Information redacted by the USI

Patient 109 Personal Information redacted by the USI

Personal Information redacted by the USI

[redacted]

Patient 109 Personal Information redacted by the USI

Personal Information redacted by the USI

Stinson, Emma M

From: Magill, Lorraine <Personal Information redacted by the USI>
Sent: 31 October 2016 16:49
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 109
Attachments: Patient 109 RepliestoNFBP Personal Information redacted by the USI

Mr O'Brien

The Directorate of Legal Services have asked this office to share the attached reports with you;

- Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information;
- Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information;
- Supplementary Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information
- Plaintiff's Replies to Notice for Further and Better Particulars – .

Can you please confirm if you have any comments to make on same?

Regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI Ext: Personal

Irrelevant redacted by the USI

From: Ciaran Barker [Personal Information redacted by the USI]
Sent: 31 October 2016 11:18
To: Wasson, Karen
Cc: Magill, Lorraine
Subject: RE: Patient 109

"This email is covered by the disclaimer found at the end of the message."

Karen Wasson
Acting Litigation Manager
Southern Health & Social Care Trust
First Floor
Nurses Home
Daisy Hill Hospital
5 Hospital Road
NEWRY BT35 8DR

Date: 31 October 2016 Our Ref: Personal Information redacted by the USI Your Ref:

Dear Madam

Patient 109 -v- NORTHERN HEALTH & SOCIAL CARE TRUST & SOUTHERN HEALTH AND SOCIAL CARE TRUST

I refer to the above matter and hereby attach the following liability reports and pleading received from the Plaintiff's solicitors for your attention.

- Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information redacted by the USI
- Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information redacted by the USI;
- Supplementary Medico-legal Report of Mr Personal Information redacted by the USI, Personal Information redacted by the USI, dated Personal Information redacted by the USI
- Plaintiff's Replies to Notice for Further and Better Particulars – Personal Information redacted by the USI.

Yours faithfully

Ciaran Barker, Legal Assistant
Directorate Of Legal Services, Business Services Organisation
2 Franklin Street, BT2 8DQ
Telephone Personal Information redacted by the USI
Email Personal Information redacted by the USI

Personal Information redacted by the USI

IN THE HIGH COURT OF JUSTICE IN NORTHERN IRELAND
QUEEN'S BENCH DIVISION

BETWEEN:

Patient 109

(A PERSON UNDER A DISABILITY)
BY Personal Information redacted by the USI AND NEXT FRIEND

Plaintiff:

And

SOUTHERN HEALTH AND SOCIAL CARE TRUST

And

NORTHERN HEALTH AND SOCIAL CARE TRUST

Defendants:

Personal Information redacted by the USI

[redacted]

To:- **The Defendants and their Solicitors**
A Maginness
Chief Legal Adviser
Business Services Organisation
Directorate of Legal Services
2 Franklin Street
Belfast
BT2 8DQ

Medico-Legal Report
on
Causation and Breach

NAME: Patient 109

D.O.B. Personal Information redacted by the USI

ADDRESS: Personal Information redacted by the USI

SOLICITORS FOR THE CLAIMANT:
Personal Information redacted by the USI

REFERENCE: Personal Information redacted by the USI

CONCERNING: Bilateral testicular torsion occurring in Personal Information resulting in complete loss of testicles and loss of fertility and hormonal functions.

PRESENTED BY: Personal Information redacted by the USI

DATE: Personal Information redacted by the USI

CONTENTS

Summarised Curriculum Vitae

Personal Information redacted by the USI MS FRCS FRGS

Personal Information redacted by the USI

Address for all correspondence

Personal Information redacted by the USI

Personal Details

Name	Personal Information redacted by the USI
Date of Birth	
Nationality	
Marital Status	
Residence	
Defence Union	
GMC No.	

Education and Honours

Education:

Personal Information redacted by the USI

Higher Education:

Personal Information redacted by the USI

Degrees and Qualifications:

Personal Information redacted by the USI

Prizes & Honours:

Personal Information redacted by the USI

Current Appointments

- Personal Information redacted by the USI

Previous Appointments

- Personal Information redacted by the USI

Area of Expertise:

I have been a superregional urological specialist for both open and endoscopic renal (kidney) surgery for many years, with a particular interest in stone disease. Personal Information redacted by the USI Personal Information redacted by the USI

I am a member of the British Association of Urological Surgeons, Uro-oncology Section, and have been Personal Information redacted by the USI, which was responsible for the governance and outcome of all tumour surgery in the region. I have extensive experience of both renal and bladder cancer surgery, and worked for a

number of years at the Personal Information redacted by the USI as well as the Personal Information redacted by the USI

I am completely conversant with the medical and endoscopic techniques for the treatment of prostate disease.

I Personal information redacted by USI urological day surgery with emphasis on minimally invasive methods. Most scroto-genital surgery can be performed as a day case (circumcision, vasectomy, vasectomy reversal, epididymal cysts, varicocoeles, and testicle removal).

I have Personal Information redacted by the USI years' experience dealing with the major surgical complications following gynaecological surgery (perforated bladder, fistulae, ureteric damage) I was lead clinician in this respect serving a very busy Obs and Gynae unit.

In the last Personal information redacted by the USI years I have become interested in Urological Pain Syndromes (painful bladder syndrome, urethral syndrome, prostatitis, pelvic pain of a urological origin, chronic testicular pain). I have developed a number of novel treatments for these difficult conditions with a good degree of success.

Personal Information redacted by the USI

Personal Information redacted by the USI

I have completed seven years of regular appraisals and continue to do so.

Medico-Legal

Personal Information redacted by the USI

Summary of Research Activities

Personal Information redacted by the USI

Research Degrees from my Department

Degree	Supervised	Status	Funding
Personal Information redacted by the USI			

Mountain Medicine

Personal Information redacted by the USI

Membership of Learned Societies, Professional Organisations and Charities. (Past and Present)

Personal Information redacted by the USI

Personal Information redacted by the USI

*= Present

I have completed a successfully annual appraisal since its introduction in 2004.

Personal Information redacted by the USI

Legal Statement

I Personal Information redacted by the USI declare that:

1. I understand that my primary duty in written reports and giving evidence is to the Court, rather than the party who engage me.

2. As an expert I am aware of my duty is to the Court and that the work undertaken must meet the requirements of Part 35.

3. I have endeavoured in my reports and in my opinions to be accurate and to have covered all relevant issues concerning the matter stated which I have been asked to address.

4. I have endeavoured to include in my report those matters of which I have knowledge or which I have been made aware that might adversely affect the validity of my opinion.

5. I have indicated the sources of all information I have used.

6. I have not, without forming an independent view, included or excluded anything that has been suggested to me by others (in particular my instructing lawyers).

7. I will notify those instructing me immediately and confirm in writing if for any reason my existing report requires any correction or qualification.

8. I understand that:
    a. My report, subject to any corrections before swearing as to its correctness, will form the evidence to be given under oath or affirmation.
    b. I may be cross-examined on my report by a crossing examiner, assisted by an expert.
    c. I am likely to be the subject of public adverse criticism by the judge if the Court concludes that I have not taken reasonable care in trying to meet the standards set out above.

9. I confirm that I have not entered into any arrangement whereby the amount of money or my fees is in any way dependent on the outcome of the case.

10. I confirm that I have made clear which facts and matters referred to in this report are within my knowledge and which are not. Those that are within my knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.

INFORMATION RECEIVED

1. Letter of instruction [redacted]

2. Letter from Legal Services Commission confirming funding, [redacted]

3. Black folder containing medical records pertaining to general practice records, the hospital records of Craigavon Hospital and those of the Northern Health and Social Care Trust.

I have not seen the client.

I confirm that I have the appropriate experience to report on both the clinical aspects of this case and the medico-legal aspects of this case, having routinely been involved in the management of such cases in my career.

I confirm this report has been produced for the benefit of the court.

ABBREVIATED CHRONOLOGY

PRE-INDEX EVENT

Personal Information redacted by the USI

HISTORY OF INDEX EVENT

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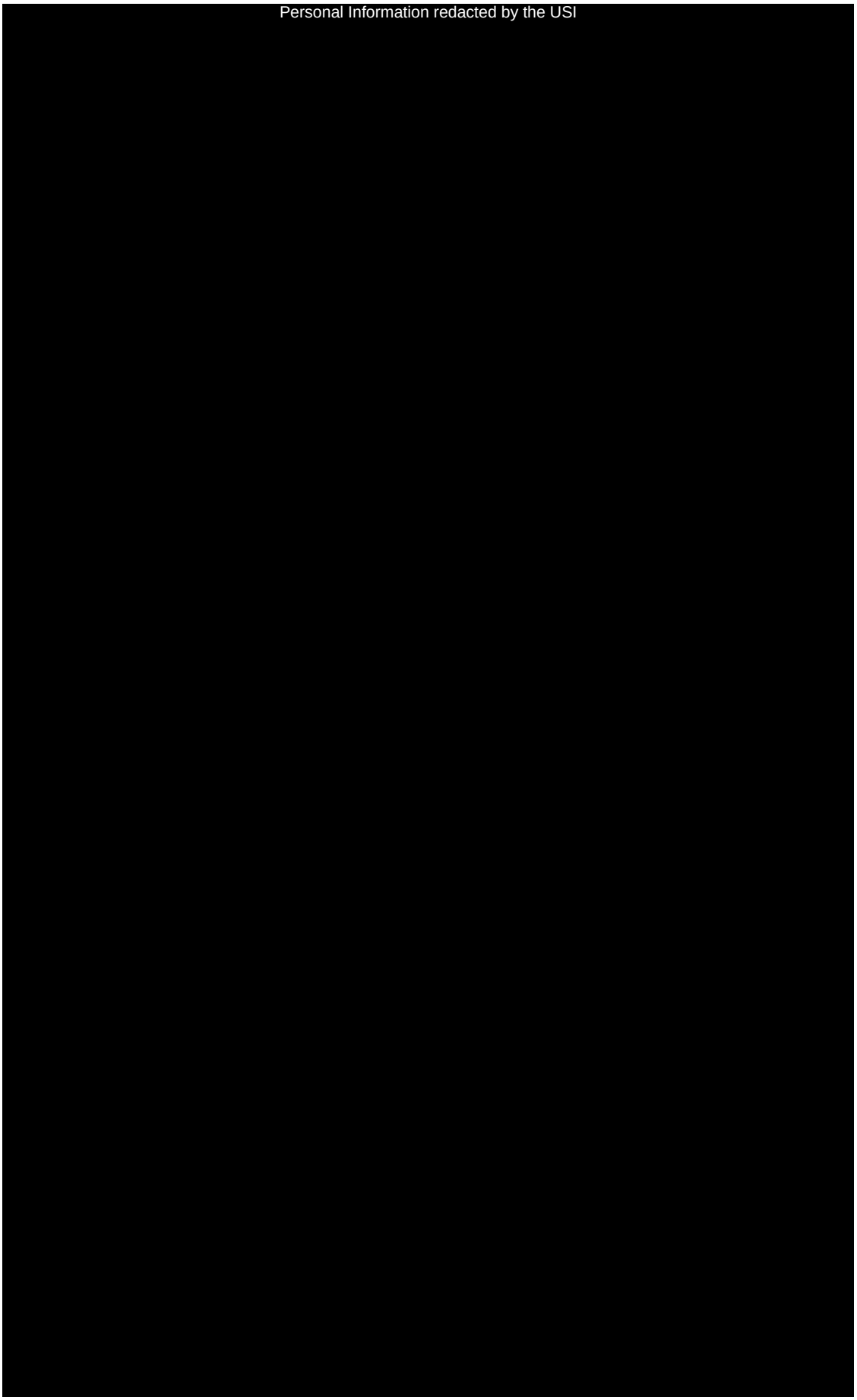

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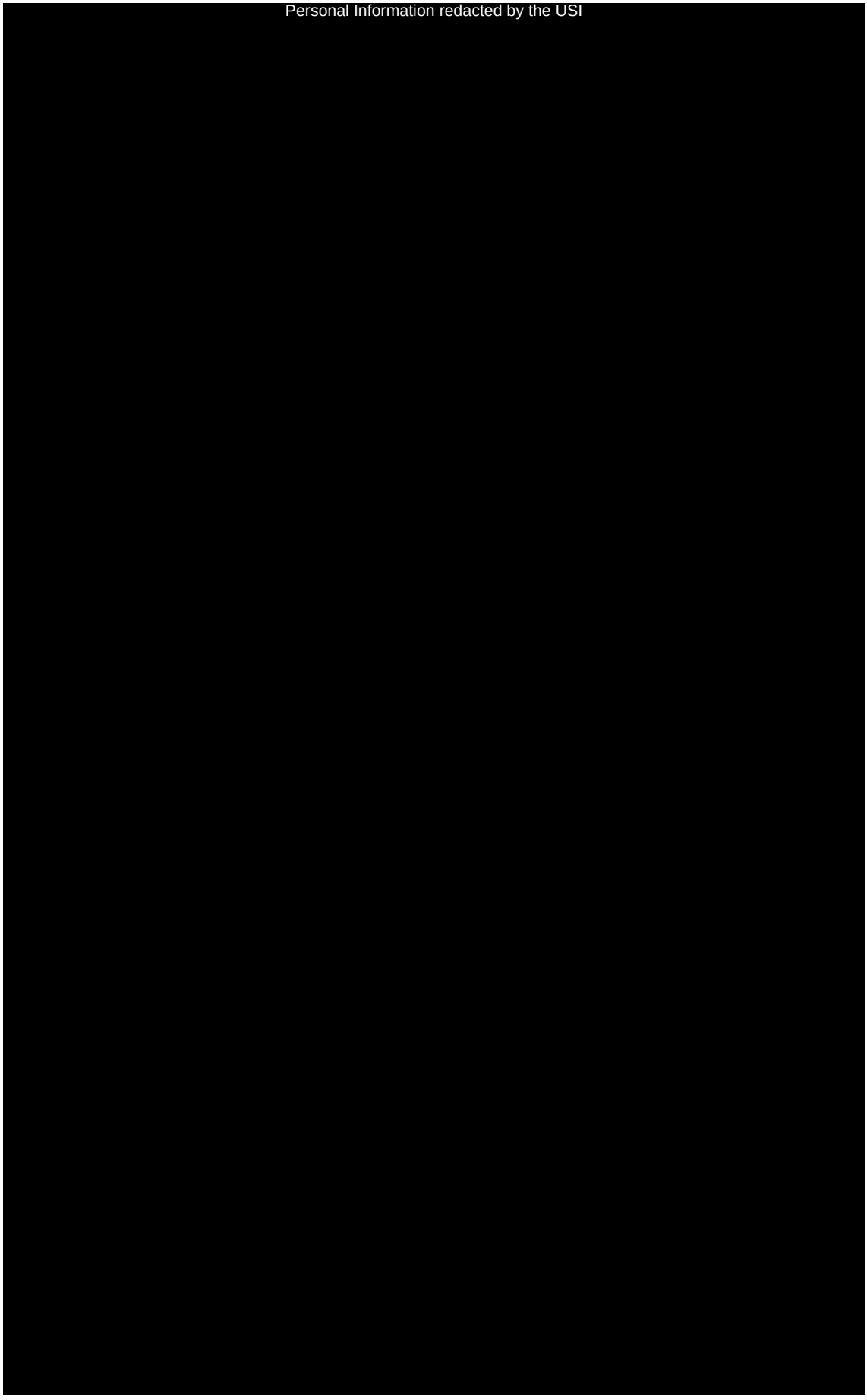

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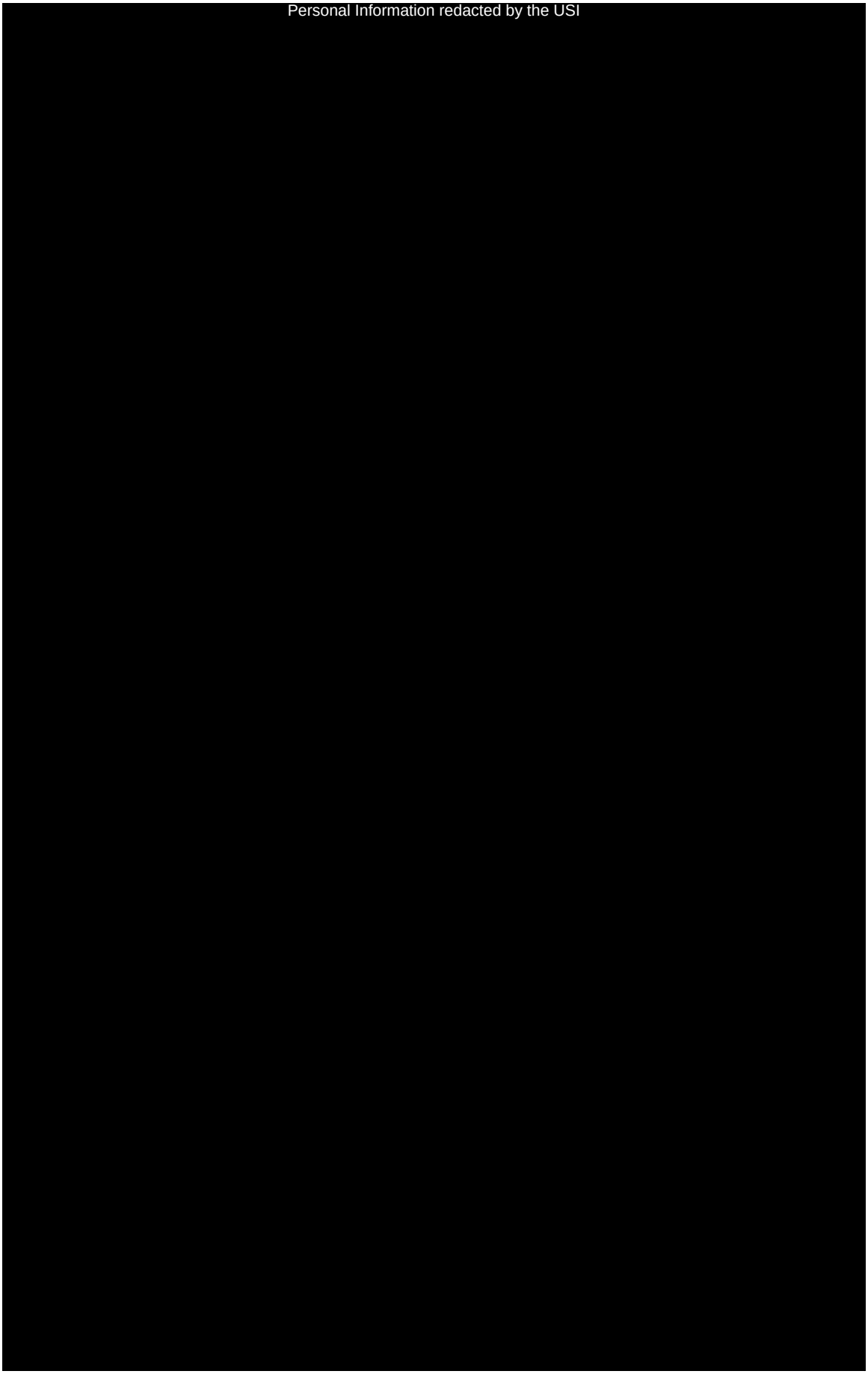

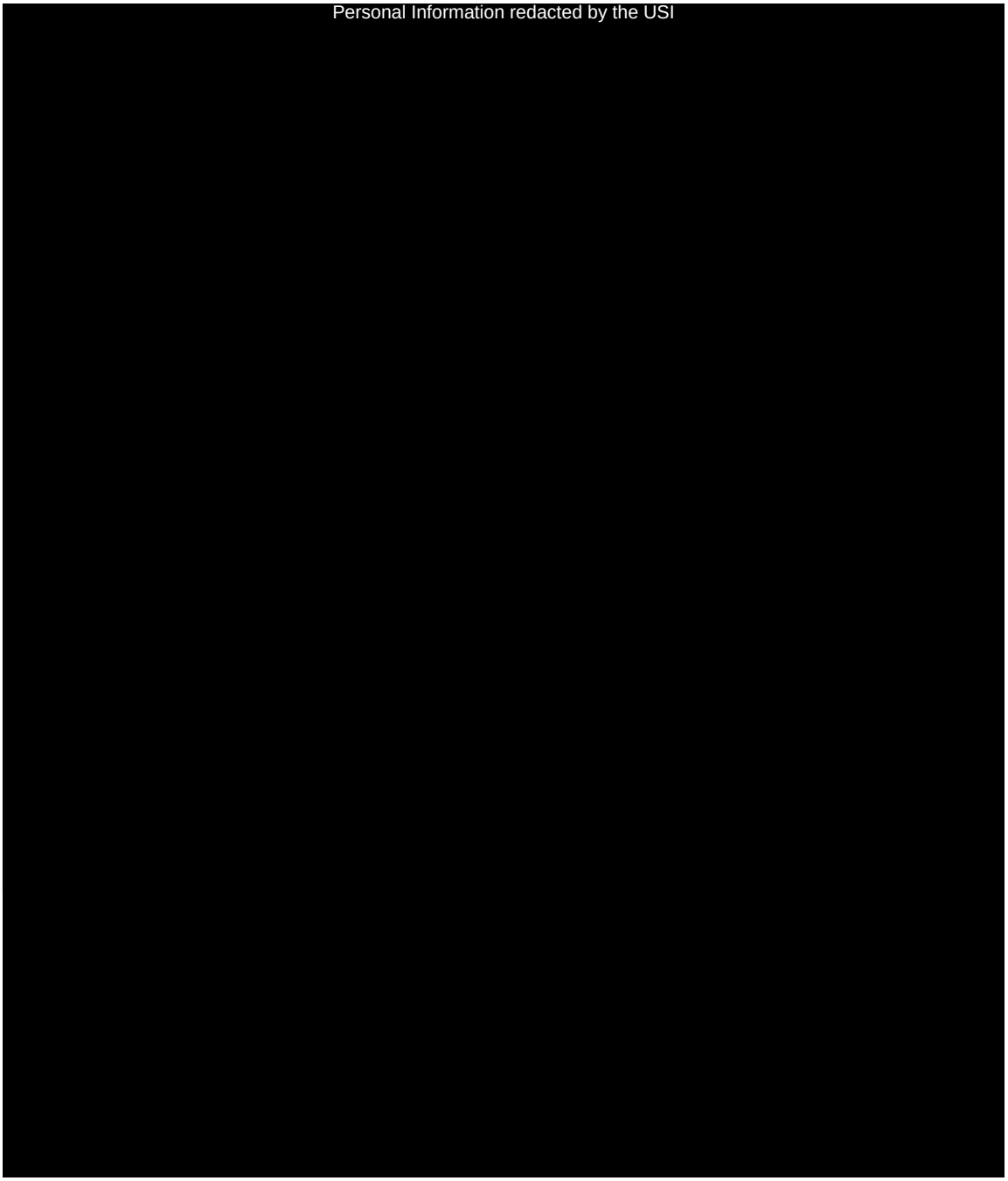

OPINION

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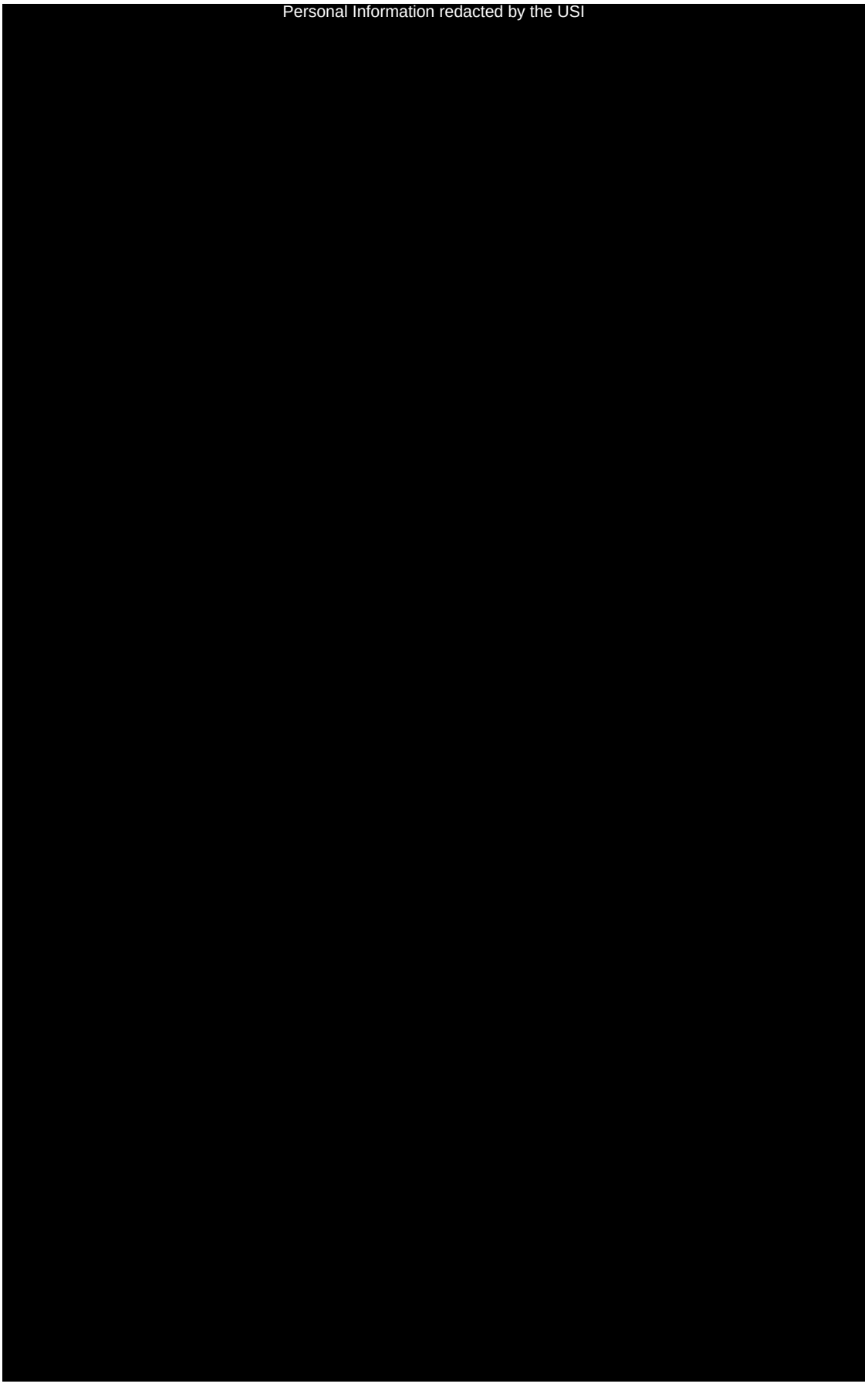

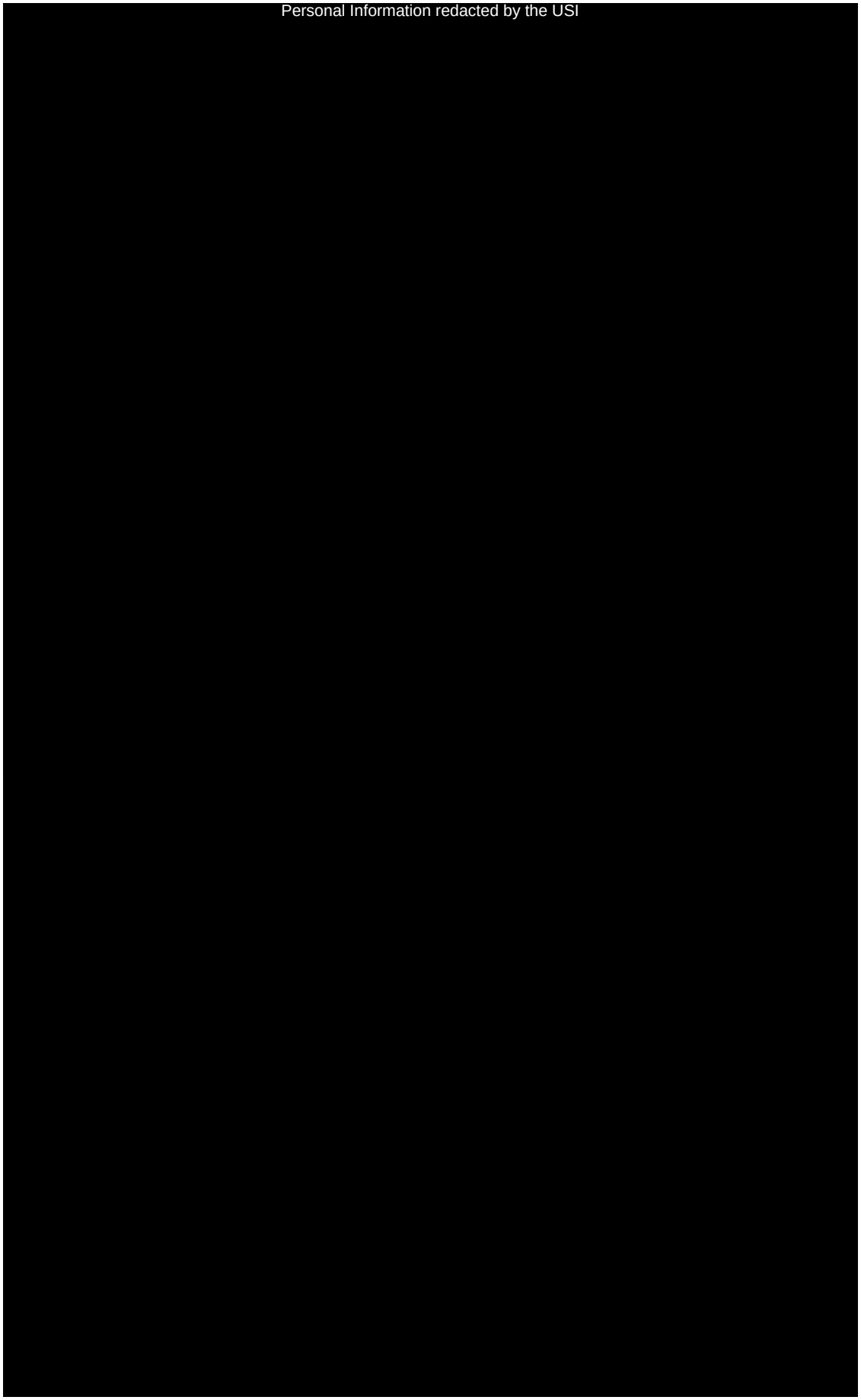

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Personal Information redacted by the USI

ISSUES OF POTENTIAL BREACH

Personal Information redacted by the USI

CAUSATION

Patient 109 DOB Personal Information redacted by the USI

Histopathology Report for the Court

Prepared by:

Personal Information redacted by the USI

This report represents the opinion of Personal Information redacted by the USI

Personal Information redacted by the USI

This report is prepared from information provided by [redacted] where I have available hospital records, a letter of claim, and a report by Mr [redacted]. I have reviewed the pathology slides made available to me.

Details of expertise

[redacted]'s qualifications are MB B Chir MA and FRCPath. My expertise is in the areas of genito-urinary and endocrine pathology, especially testicular neoplasia where he sees over 100 cases per year, both locally and in his referral practice. He is basing this report on the current medico-pathological literature on this subject, as well as his own experience of diagnosing testicular cancer over 18 years.

[redacted]

Home address

[redacted]

Work Address

[redacted]

Re: Patient 109 **v SOUTHERN HEALTH AND SOCIAL CARE TRUST AND NORTHERN HEALTH AND SOCIAL CARE TRUST.**

Ref: Personal Information redacted by the USI

Synoposis

Personal Information redacted by the USI

Pathology Review of recut slides by Personal Information redacted by the USI.

Personal Information redacted by the USI

Personal Information redacted by the USI

Conclusion

Invoice for Medico-legal work for Patient 109's mother on behalf of Patient 109

Personal Information redacted by the USI

Reporting pathology slides 1 and a half hours for report writing and slide examination

Personal Information redacted by the

Payable to:

Personal Information redacted by the USI

With thanks

Personal Information redacted by the USI

Supplementary Report on Causation and Breach

NAME: Patient 109

D.O.B. Personal Information redacted by the USI

ADDRESS:

SOLICITORS FOR THE CLAIMANT: Personal Information redacted by the USI

REFERENCE: Personal Information redacted by the USI

CONCERNING: I have been asked to prove a supplementary report in the light of Personal Information redacted by the USI analysis of the pathology of the right and left testicle in Personal Information redacted by from The Court.

PRESENTED BY: Mr Personal Information redacted by the USI
Personal Information redacted by the USI

DATE: Personal Information redacted by the USI

Legal Statement

1. I understand that my duty in providing written reports and giving evidence is to help the Court, and that this duty overrides any obligation to the party by whom I am engaged or the person who has paid or is liable to pay me. I confirm that I have complied and will continue to comply with my duty.

2. I confirm that I have not entered into any arrangement where the amount or payment of my fees is in any way dependent on the outcome of the case.

3. I know of no conflict of interest of any kind, other than any which I have disclosed in my report.

4. I do not consider that any interest which I have disclosed affects my suitability as an expert witness on any issues on which I have given evidence.

5. I will advise the party by whom I am instructed if, between the date of my report and the trial, there is any change in circumstances which affect my answers to points 3 and 4 above.

6. I have shown the sources of all information I have used.

7. I have exercised reasonable care and skill in order to be accurate and complete in preparing this report.

8. I have endeavoured to include in my report those matters, of which I have knowledge or of which I have been made aware, that might adversely affect the validity of my opinion. I have clearly stated any qualifications to my opinion.

9. I have not, without forming an independent view, included or excluded anything which has been suggested to me by others, including my instructing lawyers.

10. I will notify those instructing me immediately and confirm in writing if, for any reason, my existing report requires any correction or qualification.

11. I understand that;
my report will form the evidence to be given under oath or affirmation;
questions may be put to me in writing for the purposes of clarifying my report and that my answers shall be treated as part of my report and covered by my statement of truth;

12. the court may at any stage direct a discussion to take place between experts for the purpose of identifying and discussing the expert issues in the proceedings, where possible reaching an agreed opinion on those issues and identifying what action, if any, may be taken to resolve any of the outstanding issues between the parties;

13. the court may direct that following a discussion between the experts that a statement should be prepared showing those issues which are agreed, and those issues which are not agreed, together with a summary of the reasons for disagreeing;

14. I may be required to attend court to be cross-examined on my report by a cross-examiner assisted by an expert;

15. I am likely to be the subject of public adverse criticism by the judge if the Court concludes that I have not taken reasonable care in trying to meet the standards set out above.

16. I have read Part 35 of the Civil Procedure Rules, the accompanying practice direction and the Guidance for the instruction of experts in civil claims and I have complied with their requirements.

17. I am aware of the practice direction on pre-action conduct. I have acted in accordance with the Code of Practice for Experts.

STATEMENT OF TRUTH

18. I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.

DETAILED COMMENTS ON Personal Information redacted by the USI **REPORT DATED** Personal Information redacted by the USI

Personal Information redacted by the USI

Stinson, Emma M

From: Magill, Lorraine <Personal Information redacted by the USI>
Sent: 31 October 2016 16:47
To: O'Brien, Aidan
Cc: Elliott, Noleen
Subject: Patient 109 Personal Information redacted by the USI Pathology review on Patient 109 case.docx; Reference 2.pdf; Reference 3.pdf; Reference 5.pdf; Reference 6.pdf; Reference 7.pdf; Reference 8.pdf; Reference 9.pdf; Reference 10.pdf
Attachments:

Mr O'Brien
The Directorate of Legal Services have asked this office to share the attached report and reference with you. Can you please confirm if you have any comments to make on same?
Regards

Lorraine Magill | Litigation Services Co-ordinator
T: Personal Information redacted by the USI Ext Personal Informati

Irrelevant redacted by the USI

From: Ciaran Barker [Personal Information redacted by the USI]
Sent: 25 October 2016 14:06
To: Wasson, Karen
Cc: Magill, Lorraine
Subject: RE: Patient 109

"This email is covered by the disclaimer found at the end of the message."

Karen Wasson
Acting Litigation Manager
Southern Health & Social Care Trust
First Floor
Nurses Home
Daisy Hill Hospital
5 Hospital Road
NEWRY BT35 8DR

Date: 25 October 2016 | Our Ref: Personal Information redacted by the USI | Your Ref:

Dear Madam

Patient 109 -v- NORTHERN HEALTH & SOCIAL CARE TRUST & SOUTHERN HEALTH AND SOCIAL CARE TRUST

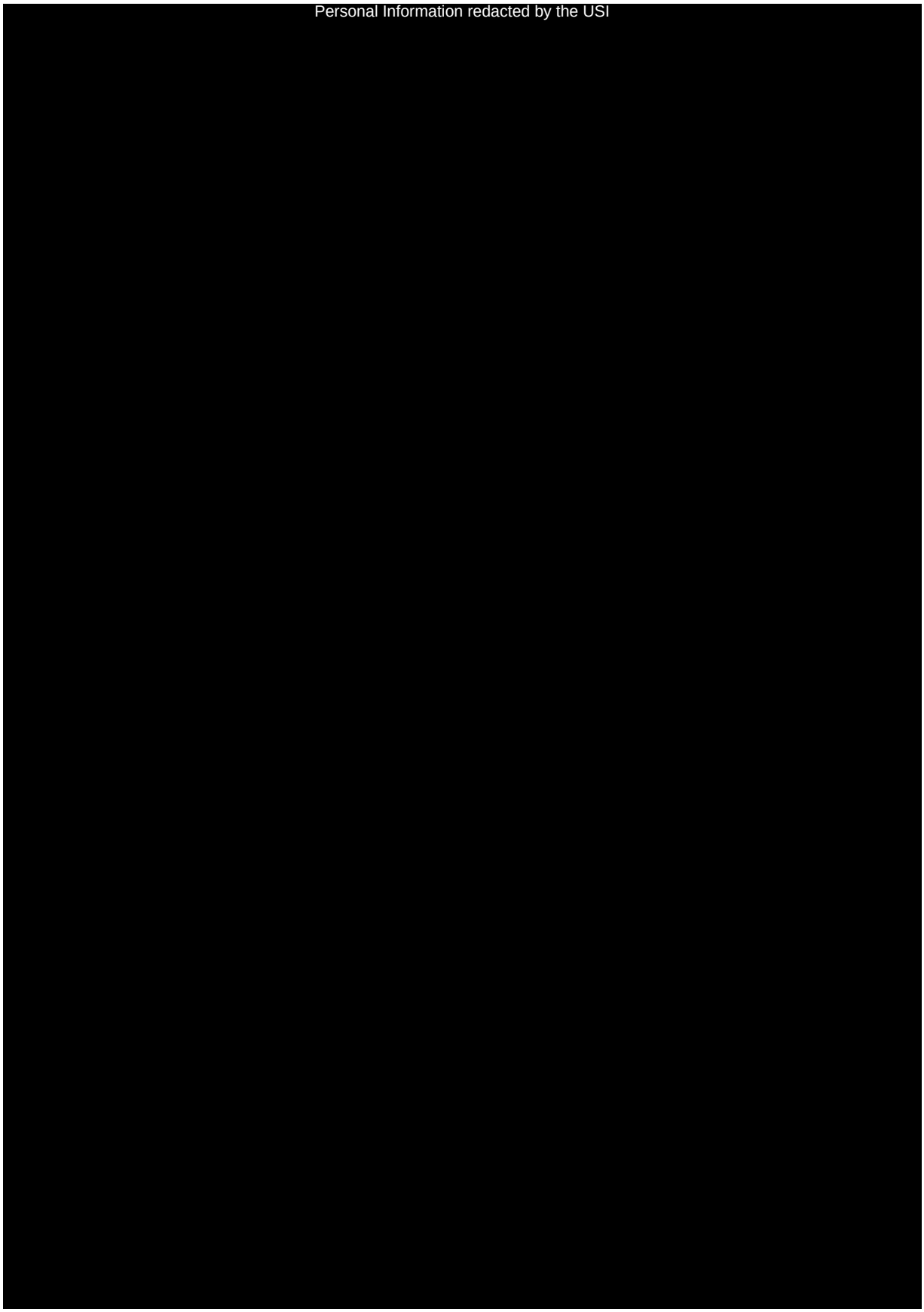
I refer to the above matter and hereby enclose a copy of the following report along with vouching medical literature.

- Personal Information redacted by the USI Undated.

Yours faithfully

Ciaran Barker, Legal Assistant
Directorate Of Legal Services, Business Services Organisation
2 Franklin Street, BT2 8DQ
Telephone Personal Information redacted by the USI
Email Personal Information redacted by the USI

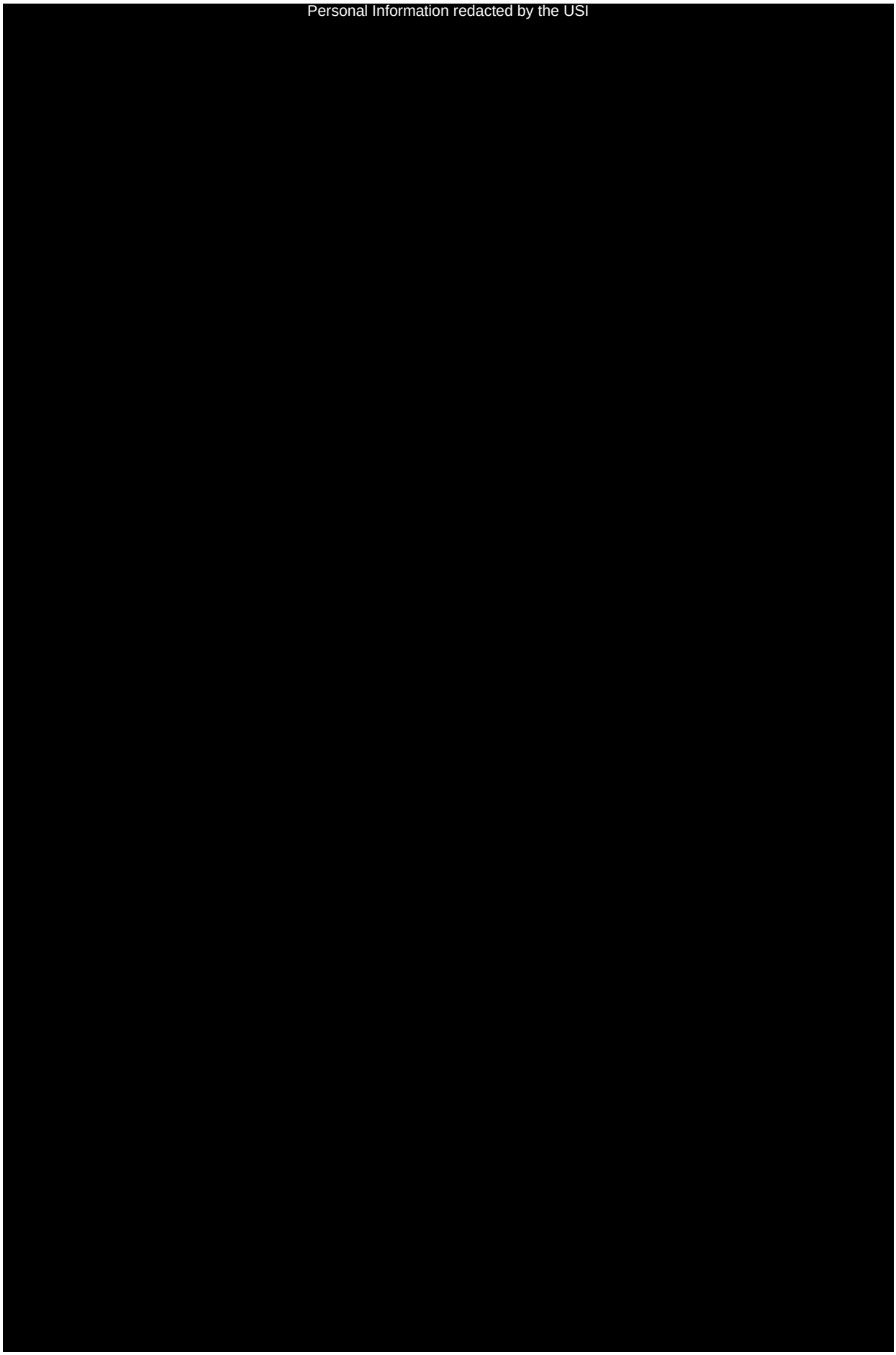
Comments on this report:



Personal Information redacted by the USI

- **Review of medical records Southern Health and social care trust (Craigavon hospital).**

Personal Information redacted by the USI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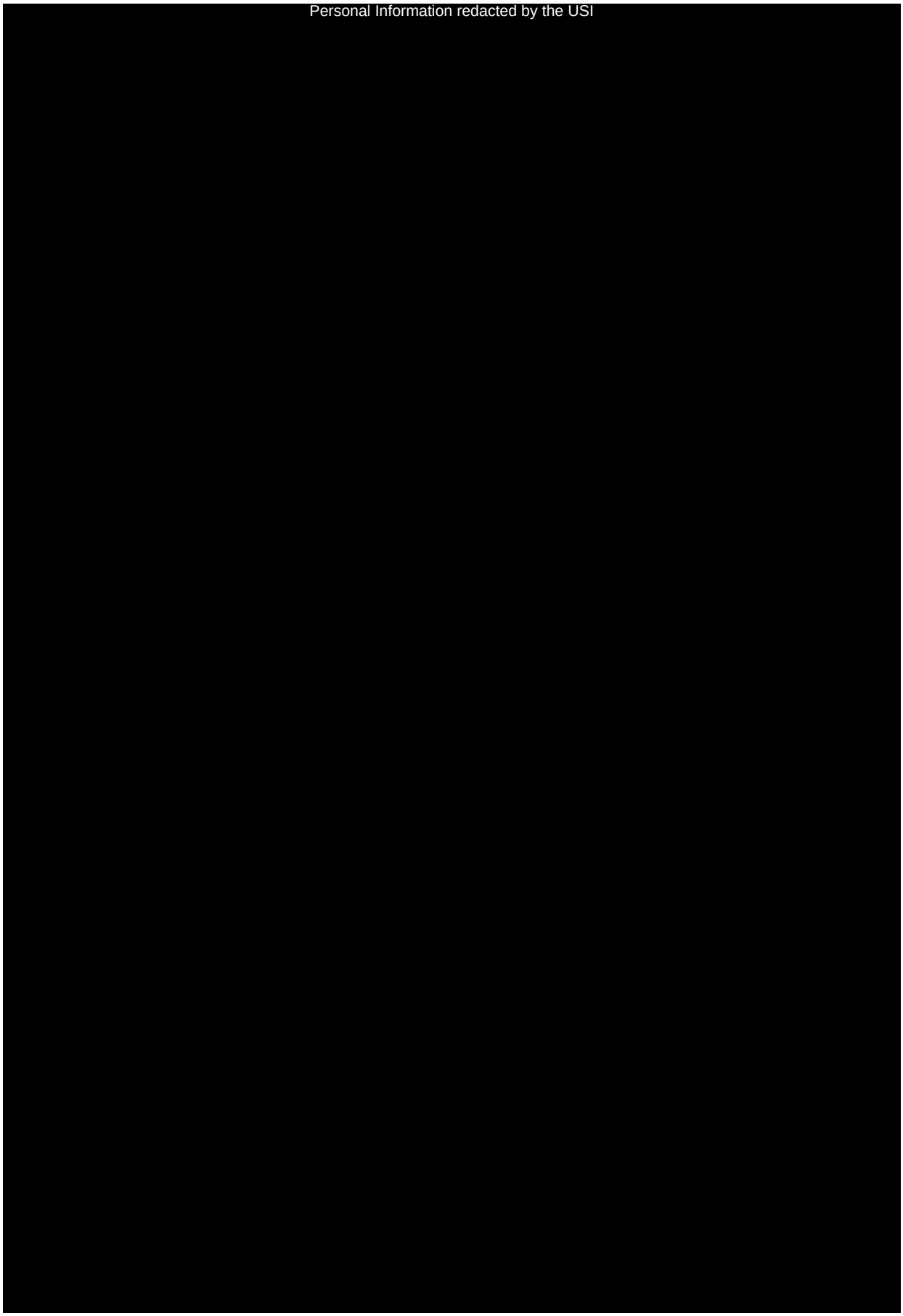
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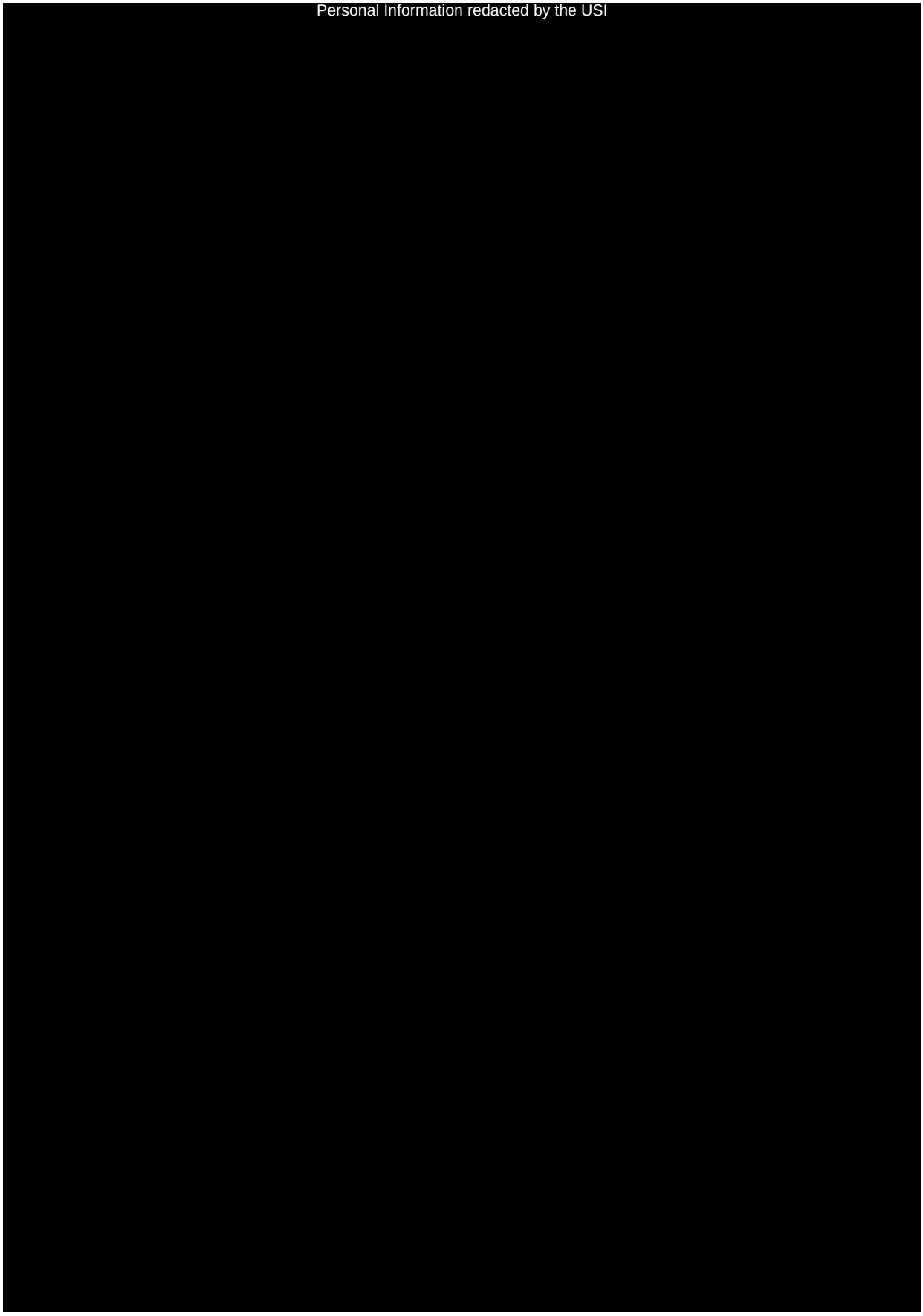
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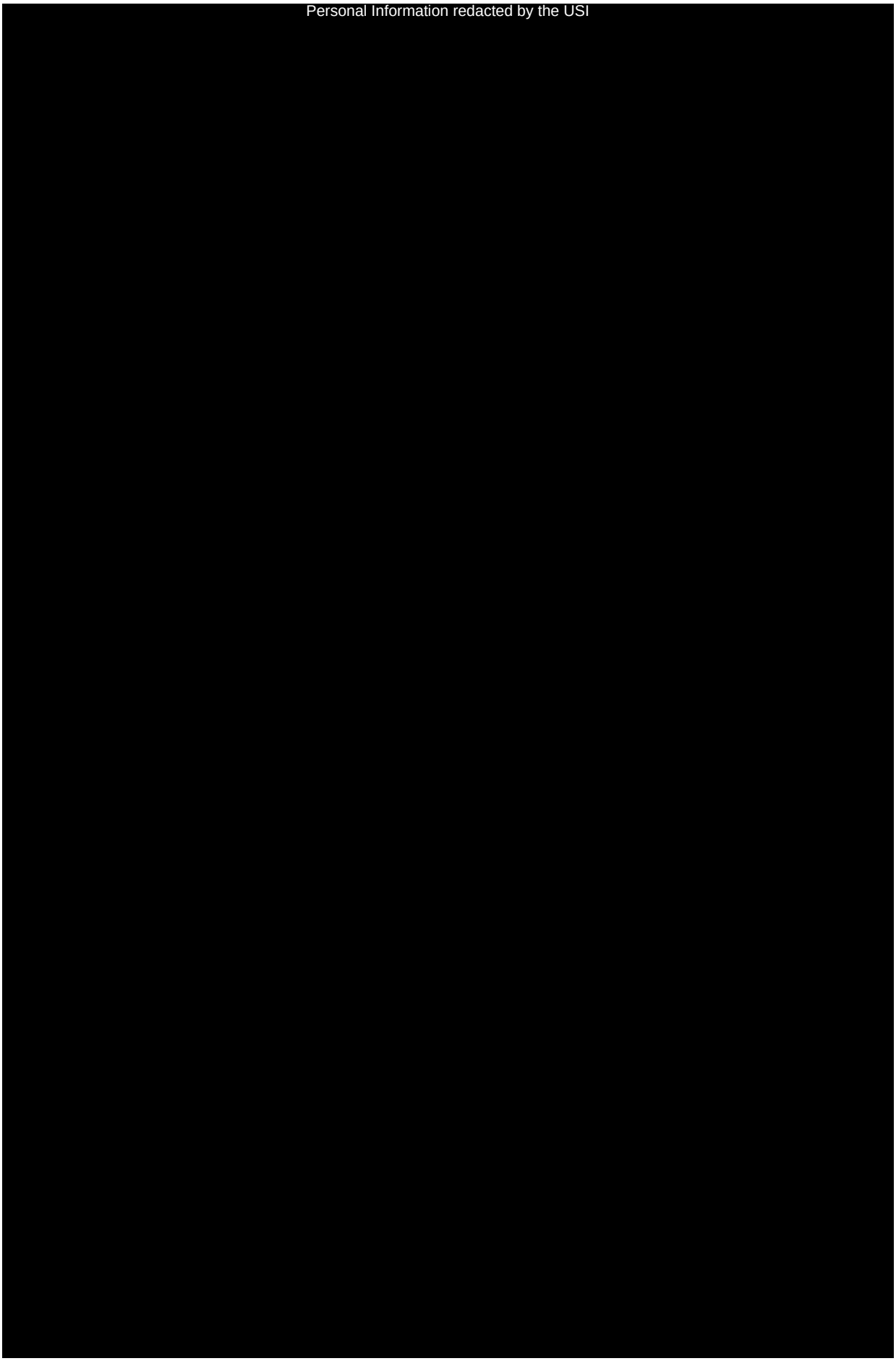
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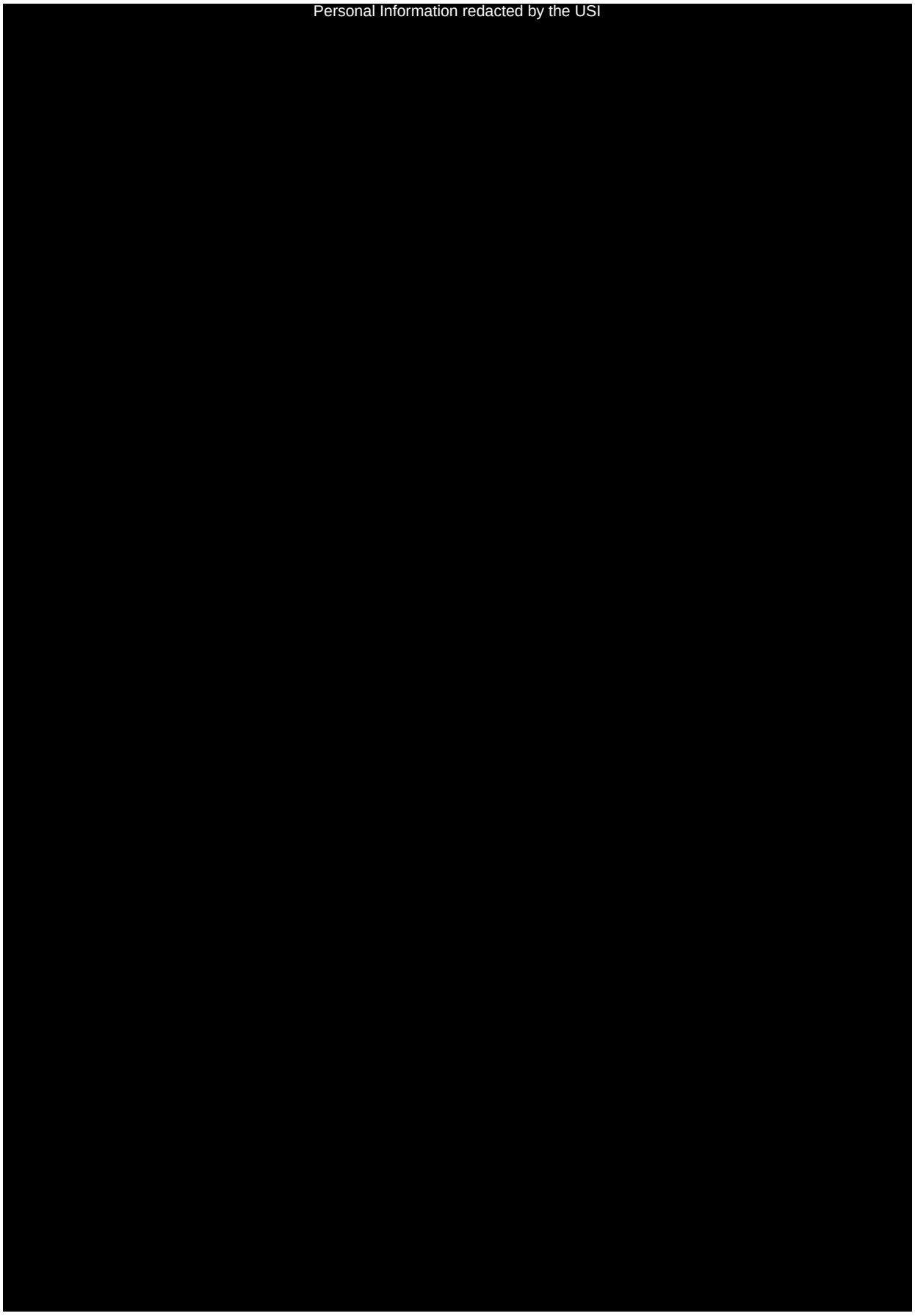
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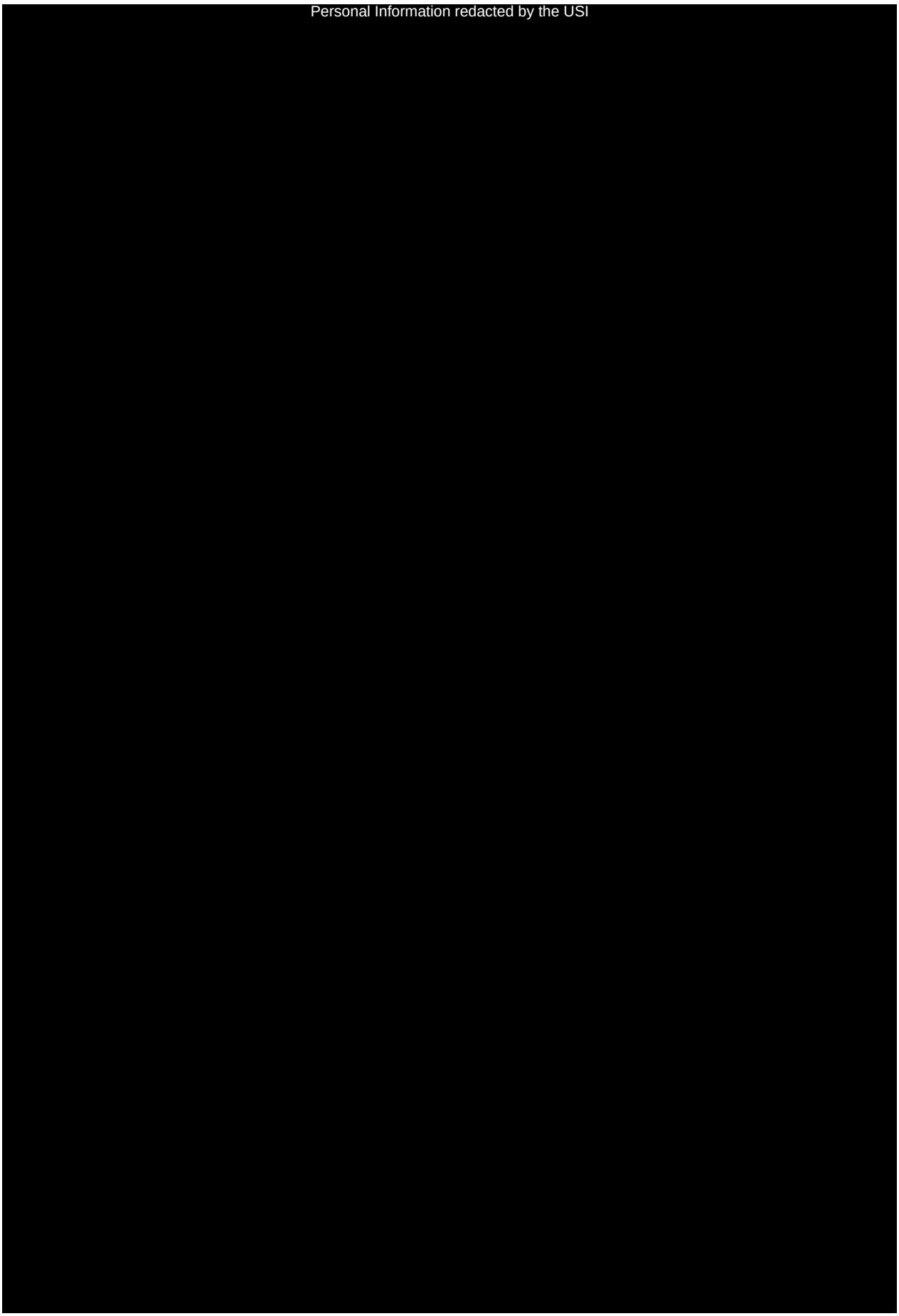
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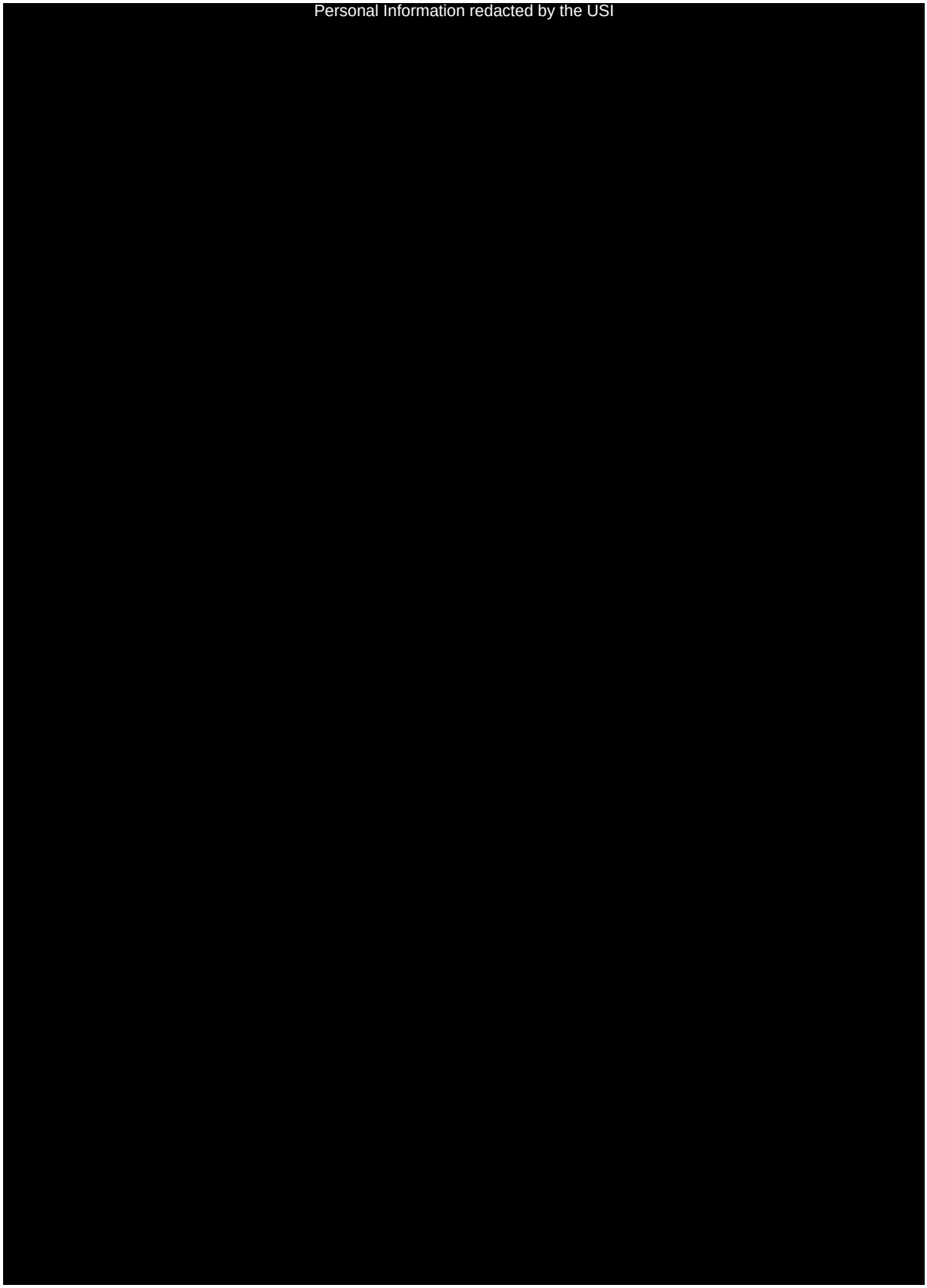
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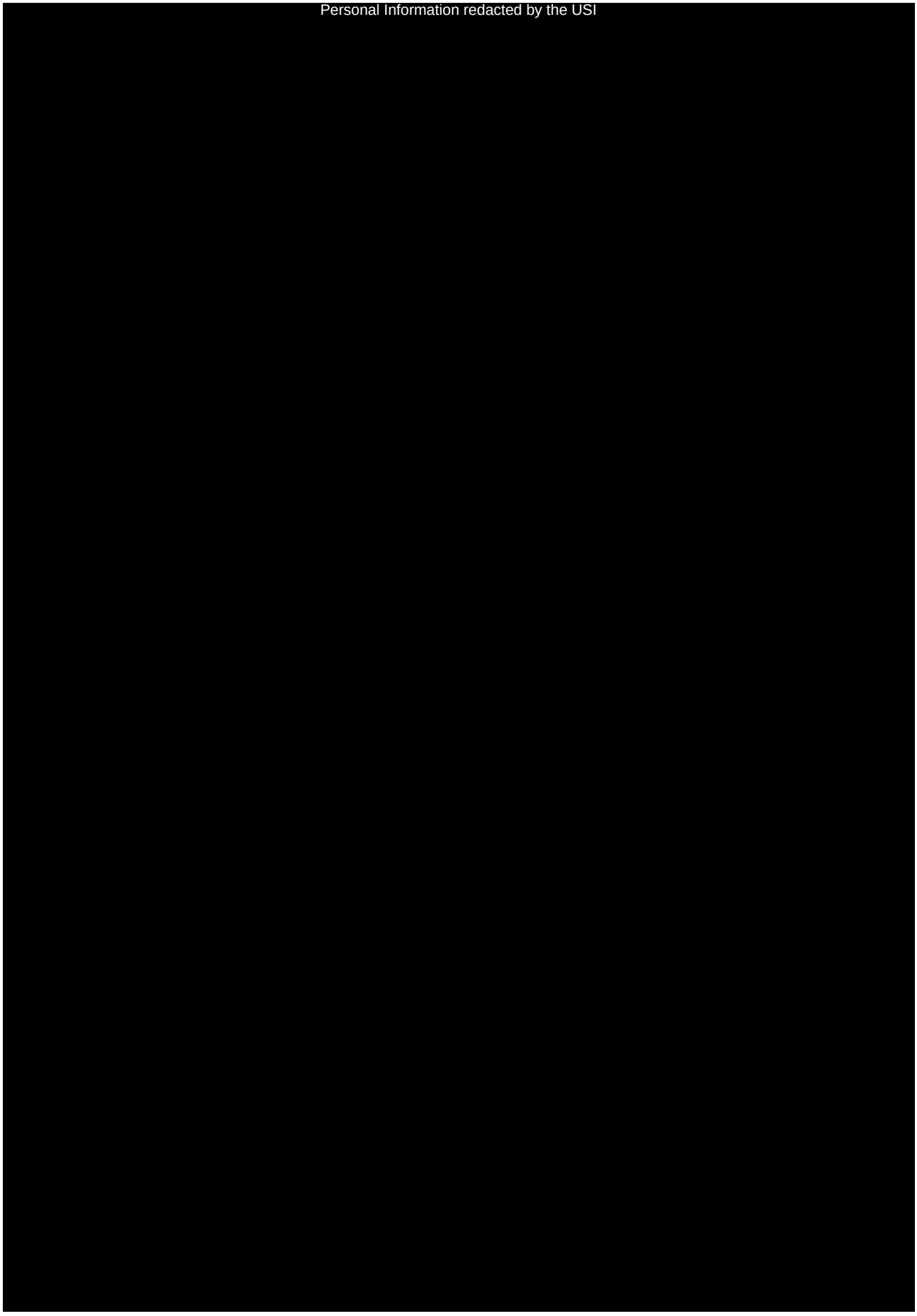
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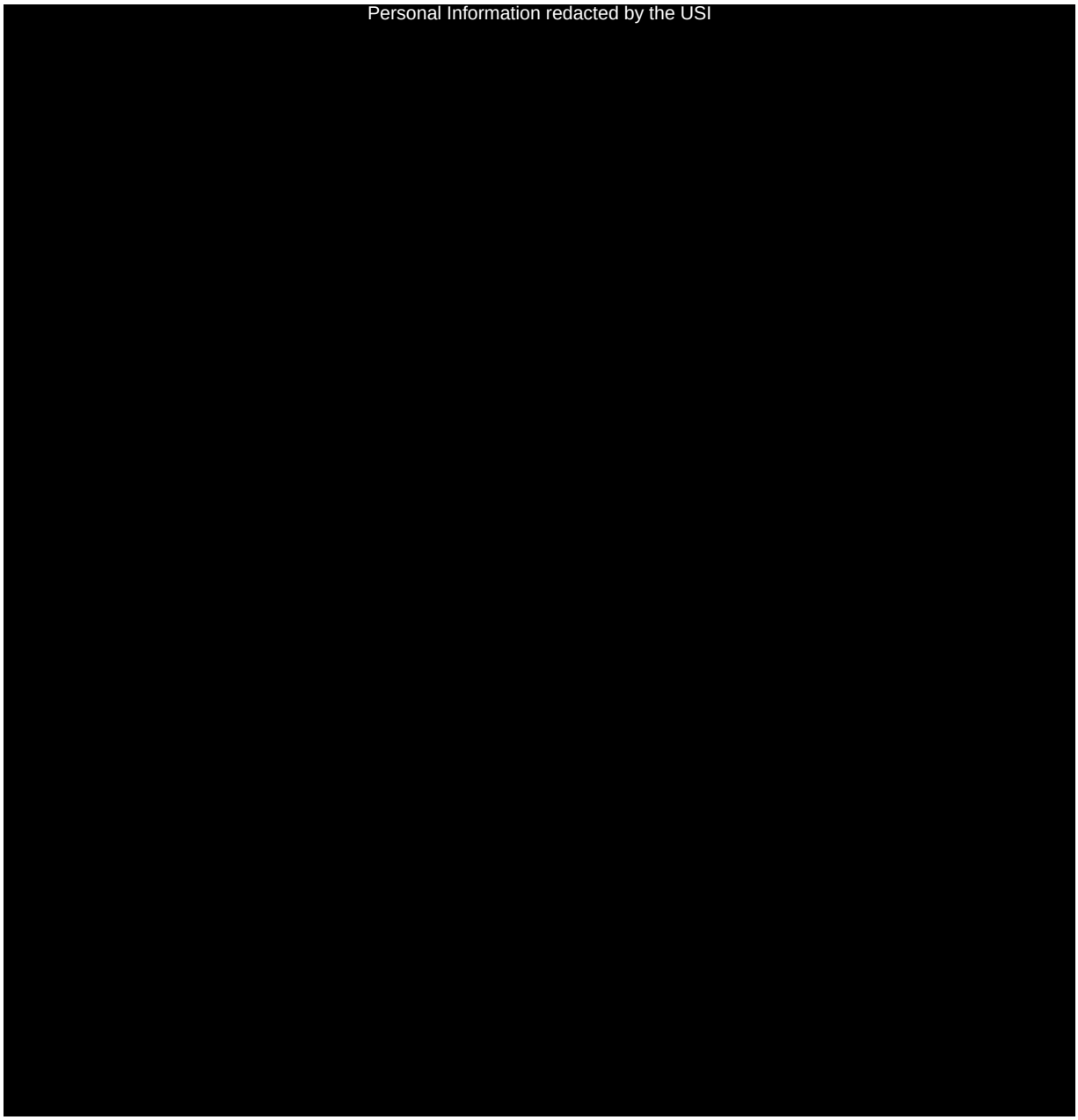
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Operative management of testicular torsion: Current practice within the UK and Ireland

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Abstract Several methods have been described and are currently used for fixation of testes in the operative treatment of testicular torsion. Although recurrence of torsion is generally viewed as a technical failure, the factors contributing to this failure remain unclear. This survey was conducted to establish current practice amongst paediatric surgeons in the UK and Ireland, in relation to testicular fixation, in an attempt to reflect the level of concern over the potential for recurrence as expressed in choice of procedure. The questionnaire survey indicated that 85% of paediatric surgeons use suture fixation of the testis alone or in combination with additional steps, such as eversion of the tunica vaginalis or creation of a dartos pouch, and 15% use a sutureless technique. The great majority (95%) fix the contralateral testis routinely and 85% routinely excise the appendix testis. Of the respondents, 17% have operated on a torted testis that had been previously fixed. In the absence of data from comparative trials, the method used for fixation remains a matter of personal preference. It was not possible to identify the definitive risk factors for recurrence from this study, but the use of absorbable sutures accompanied recurrence in most instances.

Introduction

Recurrence of testicular torsion after prior fixation can be viewed as technical failure. The choice of operative procedure is thus considered fundamental in the need to prevent this complication. The operative options include suture fixation as well as use of manoeuvres which limit future testicular mobility. Review of contemporary surgical literature provides little guidance on what is the most effective method of fixation in testicular torsion outside the neonatal period. Suture fixation has been described with both absorbable [1,2] and non-absorbable sutures [3], but concerns regarding

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testicular damage due to needle trauma have led some to adopt sutureless fixation methods, such as the Jaboulay procedure [4] or the creation of a dartos pouch [5]. The primary aim of this survey was to ascertain current practice in operative treatment of testicular torsion amongst paediatric surgeons in the UK and Ireland. A secondary aim was to enquire about experiences with recurrent torsion after previous fixation and, in particular, to determine the methods that had been initially used to fix the testis in these cases in an attempt to identify those techniques at risk from recurrence.

Methods

A postal questionnaire was sent to all members of the British Association of Paediatric Surgeons working in the UK or Ireland. The questionnaire itemized the commonly used fixation methods comprising those utilizing sutures alone (both absorbable and non-absorbable), or in combination with pouch fixation, as well as other methods used to manage the mobility of the testis (Jaboulay procedure). All combinations of these procedures were also collected. The questionnaire is seen in the Appendix.

Results

A total of 117 questionnaires were issued, with 97 responses obtained (response rate 82.9%). Two respondents failed to complete the questionnaire (one retired from active practice, one not involved in emergency surgery). These were excluded, leaving 95 responses for analysis.

Only 15% (14) of respondents rely entirely on sutureless fixation of the testis. Thirteen of these use a dartos pouch and one uses a Jaboulay procedure in isolation. Eighty-five per cent (81) of respondents use some form of suture fixation with 54% (51) using suture fixation alone, 15% (14) using the Jaboulay procedure and suture fixation, and 17% (16) using a dartos pouch as well as suture fixation.

Of those who use simple suture fixation, 41% (21) use absorbable sutures and 58% (30) use non-absorbable sutures. Of those who use suture fixation in conjunction with a Jaboulay procedure or dartos pouch, 50% use absorbable and 50% non-absorbable sutures.

The substantial majority, but not all (95%), of respondents fix the contralateral testis routinely. Four respondents indicated that they do not and one was inconsistent in this action. Similarly, there was no consistency in approach to excision of the appendix testis, with excision being the practice of most (81). Nineteen surgeons fix the testis even if the diagnosis at operation turns out to be other than torsion; 71 do not interfere with the testis and two evert the tunica vaginalis. Two surgeons indicated an inconsistent practice including occasional dartos pouch formation even if torsion is not evident, but no respondent fixes the contralateral testis in the absence of a diagnosis of torsion.

Recurrence of torsion after prior fixation was identified by 16 surgeons. The technique used previously could not be identified by seven of the respondents, but eight reported using suture fixation with an absorbable suture and one had used a dartos pouch fixation.

Discussion

There is universal agreement that the management of a testis found to be viable at operation for testicular torsion includes fixation to prevent retorsion. No consensus exists on how such fixation should be achieved. Our survey confirms that there is wide variation in the practice of paediatric surgeons in the UK and Ireland, which may reflect an assumption that all techniques are equally efficacious at pre-empting recurrence, although some methods purposely avoid breaching the integrity of the tunica albuginea.

Several experimental studies [6—8] have addressed this question of efficacy of technique in animal models. These indicated that simple suture fixation results only in fine adhesions at the suture points [6] but, when a window in the tunica vaginalis was created, dense adhesions between the tunica albuginea and the scrotal wall were seen. Other experimental work has confirmed that simple suture fixation with either silk or catgut results in fine adhesions, whereas eversion of the tunica vaginalis resulted in dense adhesions whether or not additional catgut or silk suture fixation was used [7]. The authors of this study extrapolated that use of either material should be equally efficacious in preventing recurrence, and is less important as a factor than whether the technique chosen favours eversion of the tunica vaginalis. The use of chromic catgut as a fixation technique in the animal model has however been associated with loss of testicular volume, and suture fixation generally compares unfavourably with dartos pouch fixation as a method that retains testicular size [8].

These results have led some surgeons to adopt techniques that involve creating a contact surface between the tunica albuginea and the scrotal wall, such as the Jaboulay or dartos pouch procedures,

in order to facilitate the formation of circumferential adhesions. It is not clear, however, in clinical practice whether any volume loss relates to choice of technique or ischaemic insult. This survey shows that 54% of responders use simple suture fixation and 46% use one of the above-mentioned other techniques on their own or in conjunction with suture fixation.

Literature review of recurrent torsion after previous fixation has identified 20 cases in one study [9]. In 15 of 17 cases where the type of suture at the original repair was specified an absorbable suture had been used. Two cases of recurrence after fixation with non-absorbable sutures were reported. Silk had been used in one instance and was found to have cut through at the re-exploration. In the other, polypropylene had been used in a trans-septal technique to fix the contralateral testis, which subsequently twisted [10].

A previous survey among urologists in the North West of England had shown that a majority used absorbable sutures [11], and it was previously assumed that the large number of recurrences associated with absorbable suture use was attributable to the majority of operators using this method [9]. However, this assumption is challenged by the current study which documents the use of non-absorbable sutures as the prevalent choice of technique.

Sixteen of the 95 responders in the current survey had experience with torsion after previous fixation. This number is unexpectedly high given that previous authors found only 20 cases reported in the literature. The prior operative technique could only be ascertained in seven of the 16 recurrences, and the recurrence was associated with the use of absorbable sutures in all instances. One further correspondent reported torsion after dartos fixation for undescended testis. It seems therefore that use of an absorbable suture is a significant risk factor in recurrence of torsion and should be avoided.

The vast majority (95%) of surgeons in our survey fix the contralateral testis routinely. The 'clapper bell' anomaly of the tunica vaginalis predisposing to torsion is bilateral, and cases of contralateral torsion after unilateral fixation have been described. It is perhaps surprising therefore that 4% of surgeons in our survey do *not* routinely fix the contralateral testis. The additional step of excising the appendix testis may pre-empt future torsion of the appendix and does not appear to increase morbidity. It may also avoid future diagnostic pitfalls regarding possible torsion recurrence. A majority of 85% of surgeons in our survey include this action when operating.

There is significantly less consistency in the operative strategy of managing the testis found not to be torted at operation. It is assumed that the presence of poor fixation of the tunica, as in clapper bell deformity, persuades some surgeons to proceed with fixation. However, the majority of surgeons responding to our survey do not fix the testis routinely if the diagnosis at exploration is not torsion, and none of them would fix the contralateral testis if the diagnosis were not torsion.

This survey shows a wide variation in practice amongst paediatric surgeons in the UK and Ireland in their approach to testicular fixation as part of the treatment of testicular torsion. In the absence of data from comparative trials, the method used for fixation remains a matter of personal preference. Of respondents to our questionnaire, 85% use some form of suture technique for fixation and, of those, 59% use a non-absorbable suture. Contralateral fixation is performed by 95% of surgeons and 85% remove an appendix testis if identified. This and other studies suggest that the use of absorbable sutures for suture fixation is associated with recurrence of torsion, and should be avoided.

Appendix

Questionnaire

Technique for fixation of testes at operation for torsion

	Number of sutures	Absorbable	Non-absorbable
Suture fixation of the testes			
Jaboulay procedure			
Jaboulay procedure and suture			
Dartos pouch			
Other/modification of above			

	Yes	No
Do you fix the contralateral testis routinely?		
Do you excise the appendix testis?		
Do you fix the testis if the diagnosis at exploration is not torsion?		
If yes, do you fix the contralateral testis if the diagnosis is not torsion?		
Have you ever operated for torsion of a testis that had been fixed previously?		
If yes, how was the testis fixed at the original operation?		
Any other comments:		

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Torsion of the testis

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Introduction

Torsion, or rotation of the testis with twisting of the spermatic cord, is a surgical emergency. Late presentation or failure to diagnose and correctly manage this condition leads to loss of the testis on the affected side. It is estimated that 400 boys a year in the UK will lose a testis in this way [1]. While nature's provision will normally ensure adequate endocrine and reproductive function through the remaining solitary testis, failure to treat torsion appropriately exposes the patient to the risk of a second torsion and anorchia. This is a disaster and one of the most litiginous issues in urological practice. In this article we review the condition and discuss key issues that arise from its management.

Background

Torsion is one of the commonest surgical emergencies occurring in young males, with a calculated annual incidence of 1 in 4000 amongst those under 25 years old [2]. Although it has been seen from birth to 77 years of age, there are two peaks in incidence, the largest around puberty (accounting for 65% of all torsions) with another much smaller peak in the first year of life [2,3].

The tunical vaginalis normally covers the anterior surface of the testis and extends varying distances over the epididymis and the spermatic cord. Where the coverings extend up the cord the testis is suspended freely within the tunical cavity, within which it may rotate around its narrow 'mesentery'. This so-called 'bell clapper' variant has been seen in 12% of testes at postmortem; it is the aetiology of torsion in most cases in childhood and adolescence, and is frequently bilateral [4]. The testis may adopt a horizontal position in the scrotum, which is a clue to the presence of this predisposing anatomy. Torsion occurs 'intravaginally' and is at its peak around puberty, when rapidly increasing testicular mass increases the chance of the testis rotating. In the neonatal period the descending or recently descended testis and its coverings are extremely mobile within the scrotum. In this age group the cord and coverings may twist en masse. This is referred to as an extravaginal torsion and accounts for most torsions at this early age, although intravaginal torsion is also seen.

Childhood and peripubertal torsion

Torsion in this age group usually causes acute-onset ipsilateral testicular pain but the history does not always fit this classical pattern. In reviewing 670 patients with torsion presenting in Bristol between 1960 and 1984, Anderson and Williamson [2] reported that 89% presented with this symptom. Half of those without this localizing pain had torsion of undescended testes. In 34% of patients with scrotal pain there was associated groin, abdominal or thigh pain, which could be the earliest and predominant symptom. Urinary symptoms of dysuria or frequency were noted in 5% and vomiting in 39%; 36% of patients had a history of previous unilateral or bilateral testicular pain or swelling. Injury was implicated in only 4% of cases, recent exercise in 7% and bicycle riding in 3%, while 11% were woken from sleep with the pain. Interestingly, torsion was more common during the colder months of December and January [2].

In examining a boy with possible torsion, the surgeon may be the latest in a succession of doctors to upset him. It is therefore important to spend time reassuring him and his parents, and gaining his confidence to obtain a worthwhile examination. Testicular assessment should be an automatic part of the abdominal examination in any boy, and this good habit will avoid missing those torsions presenting with more 'abdominal' symptoms. In general, the examiner should begin with the normal side where a horizontal lie to the testis suggests a bell-clapper deformity in 25%, indicating contralateral torsion [2]. On the affected side the body of the testis is tender and swollen, and rides high in the scrotum, with a thickened tender cord. The cremasteric reflex is usually absent and a detectable secondary hydrocele is found in 52% of patients. Mild fever and erythema of the overlying scrotal skin are late signs, associated with low testicular salvage rates [2].

Ischaemic testicular damage resulting from torsion is related both to the number of turns on the spermatic cord and the duration of torsion. Certainly all cases with a torsion of $>360^\circ$ and >24 h duration will have ipsilateral testicular loss or severe atrophy if the testis is left *in situ*. Severe atrophy has also been observed after as little as 4 h of torsion when the turn on the cord is $>360^\circ$ [5]. Arterial occlusion probably occurs primarily in cords with multiple twists, whereas arteriolar stasis develops secondary to the venous occlusion and

engorgement seen with lesser twists. The threshold seems to be 8 h, before which testicular atrophy is rare and after which it is the rule [6].

To preserve the testis it is vital that the torsion is corrected surgically without delay. The testis is approached through a midline scrotal incision and the diagnosis confirmed. The cord is untwisted and the testis wrapped in a warm saline-soaked swab. Whilst the result of reperfusion is awaited the contralateral testis is explored and fixed to prevent torsion occurring later on that side. This should be carried out whether a bell-clapper deformity is found or not. The twisted testis is re-appraised and if it is obviously black and dead it is removed. The Bristol series showed that of those testes that had been twisted for <12 h, only 4% appeared necrotic and were removed, but beyond this time 75% of patients underwent orchidectomy [2]. Those that appear viable are left and fixed in the scrotum. Orchidopexy should be performed with the tunical vaginalis everted and at least two 5/0 polypropylene sutures between the tunica albuginea of the testis and the dartos.

The testicular salvage rate, defined as testicular growth and development that reflects the age of the patient and the contralateral testis, is $\approx 50\%$ for all cases of torsion [2,5,6]. If obviously necrotic testes are left after surgery, a high proportion of them will spontaneously discharge through the wound [2]. In patients for whom testicular necrosis is inevitable because of the duration of symptoms, there is an argument for not operating as an emergency. It is mandatory to perform at least a contralateral orchidopexy with no undue delay, to avoid the risk of metachronous torsion and anorchia.

Those patients with intermittent torsion may have few or no clinical findings despite a history that is highly suggestive [2,3]. It appears that many torsions can resolve by spontaneous untwisting of the cord, but this is a warning that should not be ignored [7]. Three such patients reviewed by Schulsinger *et al.* [7] were found to have a horizontal lie of the symptomatic testis, with a bell-clapper deformity confirmed surgically. Some advocate attempting to untwist the testis by rotating it away from the midline, to minimize the ischaemic period. Although it may bring relief from symptoms, this manoeuvre may also be unsuccessful and cause great distress to the patient. Even if it works it should not delay the prompt surgical confirmation of the diagnosis and definitive management.

Differential diagnosis

Whilst adolescents with acute scrotal pain have a 50–60% chance of having a twisted testis, it is the underlying cause in only 25–35% of paediatric patients. Melekos *et al.* [3] reviewed 100 boys under the age of 15 years who had presented to their institutions with an 'acute scrotum'. Of these, 42% had a torsion of the testis or spermatic cord and 32% had a twisted testicular appendage. Amongst the remaining 26%, 8% had idiopathic scrotal oedema, 6% epididymo-orchitis and 3% a hernia or varicocele. Whilst any acute scrotal swelling must be regarded as torsion until proved otherwise, the ability to confidently identify these other conditions may avoid unnecessary surgery.

There are five different testicular appendages described. The most prevalent is the appendix testis which lies on the upper pole of the testis and is a vestigial remnant of the Müllerian system, found in around 90% of males and bilaterally in 60%. The other appendages are all remnants of the Wolffian system and are found on the epididymis (in half of the male population) or more rarely on the cord itself or in the epididymo-testicular groove. About 95% of twisted appendages involve the appendix testis. There is one peak in presentation at ≈ 10 years old, which is earlier than the peak for torsion [3]. The pain may be of a more gradual onset and associated symptoms of nausea, vomiting and abdominal pain are rarer. Examination may reveal a focal tenderness, usually at the upper pole of the testis, with a non-tender testis and epididymis. A palpable tender nodule at the upper pole alludes to the diagnosis and a visible engorged hydatid or 'blue dot', seen through the scrotal skin, is pathognomonic. Melekos *et al.* [3] reported these two signs in only 37% and 22% of cases, respectively. Later presentation with reactive hydrocele and secondary inflammatory changes, and the similarity of symptoms with torsion, prevents a confident diagnosis in many cases. A clear case of a twisted appendage can be managed conservatively with a combination of bed rest, scrotal support and NSAIDs. If the scrotum is explored to confirm the diagnosis, the appendage is excised. Although an asymptomatic appendage on the other testis is quite likely, it is not explored, except where a bell-clapper deformity is found incidentally, for which a bilateral orchidopexy is required. It is the authors' impression that surgical cases recover more rapidly than those treated conservatively, whose discomfort may persist over several days.

Idiopathic scrotal oedema generally occurs in boys below 7 years of age [3]. The skin is reddened and thickened but the underlying testis and epididymis are not tender. The oedema extends upwards into the groin, downwards into the perineum to the anal verge, is frequently bilateral and resolves over 2–3 days with no active management. Few of these patients proceed to surgery, because the diagnosis is usually apparent.

Infective inflammation of the epididymis, testis or both causes scrotal pain and swelling. It is important to recognize that these are rare in children and that they are

the commonest misdiagnosis of torsion. They are usually associated with a gradual onset of pain, fever and urinary tract symptoms and findings. As noted, even unequivocal urinary symptoms do not enable torsion to be excluded. Occasionally no other stigmata of urinary infection are found and microbiology of the urine is not confirmatory. It is not unusual to explore these patients to confirm the diagnosis. When urinary infection and/or epididymo-orchitis is confirmed it is important to exclude underlying urinary tract anomalies. These include lower tract obstruction (urethral valves) and sphincter dysfunction (neuropathic bladder) both of which promote vasal reflux. Vasal drainage may be impaired by the utriculus seen in severe hypospadias, and the rare ectopic ureters that drain into the vasal system present with epididymitis. Investigation should at least include ultrasonography and probably a micturating cysto-urethrogram in younger boys.

Other diagnoses that may rarely mimic torsion include hydrocele, hernia, tumour, varicocele and trauma. Although these are all associated with scrotal swelling, specific aspects of their histories and clinical findings make them easier to differentiate from torsion. Henoch Shönlein purpura can present with an acutely tender scrotum but the characteristic skin manifestations elsewhere are diagnostic; simultaneous torsion is rare but has been reported in this condition.

Investigations and strategies to reduce surgical intervention

In recent years the high rates of so-called unnecessary explorations have led to the search for adjunctive tests to improve the accuracy of diagnosis. Testicular blood flow can be accurately detected with a ^{99m}Tc-radioisotope scan, and colour Doppler ultrasonography approaches the accuracy of this, given a skilled operator. However, both methods are subject to availability of equipment and personnel, and require the cooperation of the patient. They should not be used routinely unless the delay involved in obtaining them is minimal. They can provide useful information in patients in whom the diagnosis of torsion seems unlikely or the duration of symptoms indicate a dead testis if torsion is the cause.

Reports of patients with positive blood flow on Doppler ultrasonography who in fact had torsion reinforce the view that the diagnosis should be clinical and that the priority is expeditious surgical management [8]. Negative explorations are a necessary consequence of this approach. To our knowledge there has been no lawsuit for a scrotal exploration that was unnecessary in retrospect, neither has there been any reported testicular morbidity after exploration or fixation of a normal testis [5,6]. However, it is important in obtaining consent that the parents and/or patients are fully informed about the reasoning behind the decision to operate and what it hopes to achieve.

Hastie and Charlton [9] reported a strategy to reduce the number of unnecessary emergency operations in their patients. They did not operate on patients with a clear diagnosis of appendicular torsion presenting with the blue-dot sign. If there was any doubt about the diagnosis and the history was of <24 h, the patient was urgently explored. In practice, none of the twisted testes treated after 14 h was viable. A swollen erythematous scrotum with a history of >24 h was either a dead twisted testis or appendage. These were treated expectantly; if they resolved over the next few days then a twisted appendage was confirmed. If not, the diagnosis of torsion was confirmed radiologically and the patient treated by semi-elective ipsilateral orchidectomy and contralateral fixation [9].

Neonatal torsion

About 10% of all torsions occur in the neonatal period and these can be subdivided into two groups, depending on whether the condition is seen at birth (prenatal torsion, 70%) or occurs later in previously normal testes (postnatal, 30%) [10]. Prenatal torsion occurs extravaginally and is thought to be caused by the action of the cremaster muscle on the mobile testis and its coverings. It presents at an early nappy change or at the postnatal check as a firm asymptomatic testicular mass. The testicle may be in a high or inguinal position, with bruising of the scrotal skin. The differential diagnosis of neonatal scrotal swelling includes hydrocele, hernia, testicular tumour and meconium peritonitis.

Most authors agree that immediate exploration of the prenatally twisted testis rarely if ever results in ipsilateral testicular salvage. In their review, Das and Singer [10] found no viability at exploration in 80–100% of cases and these testes were removed, with fixation of the other side. Adjunctive tests (Doppler ultrasonography and isotope imaging) may be applicable in this group to confirm the diagnosis, but will also be more difficult to perform. The need to exclude tumour and fix the other side to prevent bilateral involvement are strong arguments for urgent exploration [10]. If tumour is a possibility an inguinal incision is preferred [10]. The increased risks of anaesthesia in the newborn can be minimized by management in a specialist centre. Emergency surgery for acute swelling of a previously normal infant testis is more likely to result in salvage.

La Quaglia *et al.* [11] reported four cases of bilateral neonatal torsion; two were synchronous at birth with both testes not viable at operation. In the other two cases, with evidence of unilateral torsion at birth, the

uninvolved testis later twisted 48 h and 8 weeks after birth. Surgery confirmed the diagnoses but unfortunately the testis was only salvaged in one of these patients. Their findings confirmed the continued risk to the contralateral testis after extravaginal torsion and the policy of prompt exploration with contralateral orchidopexy in all cases of perinatal torsion [11].

Previous testicular surgery

Thurston and Whitaker [12] reported five patients in whom torsion was associated with previous ipsilateral orchidopexy and testicular biopsy. Inadequate fixation at the previous operation or single adhesions forming an axis for the testis to twist around were blamed. Eversion of the tunica and the use of nonabsorbable sutures at orchidopexy were suggested to prevent this occurrence. We suggest sutureless fixation using the dartos pouch technique [13]. There is therefore little security in excluding torsion by virtue of previous surgery, particularly as information about the previous operation may not be available at the time of acute presentation. Management decisions should therefore be based on the clinical assessment of the patient, as if no surgery had taken place.

Solitary testes

Investigation of patients with impalpable testes often reveals a blind-ending vas and vessels leading to a variable sized nubbin of testicular remnant in the scrotum. These absent testes may constitute 10% of patients with the initial diagnosis of cryptorchidism. Tureck *et al.* [14] excised these nubbins in 110 patients because of their malignant potential. Histological analysis of these revealed features in keeping with perinatal or 'silent' torsion as the aetiology of testicular loss [14]. In all of these cases the remaining testis should be fixed and this policy should be applied to solitary testes after trauma or tumour excision. There will otherwise remain a theoretical risk of torsion in these patients [15].

Fertility

Experimental studies in the postpubertal rat have shown that bilateral testicular damage and reduced fertility may result from unilateral torsion [16]. The proposed mechanism of this injury is a disruption of the 'blood-testis barrier' and the release of sperm antigens from the damaged testis, causing an immune response. This is supported by the identification of raised antibody levels and modification of the damage by immunosuppressive agents. Both humoral and cellular mechanisms are proposed. Fertility is related to the duration of torsion only if the ischaemic testis is retained in the scrotum after untwisting. Early removal of the damaged testis enables preservation of contralateral histology and normal fertility [16].

These findings reflect the previous observations of Barsch *et al.* [6] who reviewed the late results of torsion in 42 patients, and endocrine and exocrine testicular function in 30. In patients who had the testis untwisted $\leqslant 4$ h from the onset of symptoms, only half subsequently had normal semen analysis. In patients with symptoms for >24 h at the time of surgery, the three patients treated by orchidectomy had normal semen analysis, whereas it was pathological in the four where the testes were retained. In all patients with abnormal semen analysis the levels of gonadotrophins were higher [6].

Prepubertal torsion does not appear affect fertility. Clinical studies showing normal contralateral testicular growth and semen analysis [5] are supported by experiments in the prepubertal rat with normal fertility [16]. The lack of antigens from immature spermatozoa probably accounts for this difference. These data require different ideas about torsion occurring at or beyond puberty. Necrotic testes should be removed in this age group and the possibility of adjunctive pharmacological immune manipulation at the time of surgery is a possible option for the future.

Another aetiology of diminished testicular function has been proposed by groups that have routinely biopsied the normal testis after untwisting. Significant pre-existing histological abnormalities were identified in half of the patients and suggest that infertility may be related to a pre-existing testicular pathology [17].

Improving outcome

The four-fold increase in the incidence of torsion reported in the Bristol population between the early 1960s and the early 1980s shows an increasing awareness of the condition over that period; it was also associated with higher testicular salvage rates [2]. However, the number of patients losing testes remains unacceptably high and while inappropriate management or delayed specialist referral has medicolegal consequences for doctors, this may not be the most significant factor. Indeed, a review of patients in Medway (Kent, UK) showed that a delay in seeking medical advice was the main reason for poor results [1]. This highlights the need for better education of parents and young men about the potential disastrous consequences of testicular pain, but should not induce complacency amongst doctors.

Conclusions

- If a patient presents acutely with testicular pain and a

possible diagnosis of testicular torsion, an exploration should be undertaken as an emergency.

- If a patient presents with a history of intermittent testicular pain the surgeon should have a good reason for not carrying out an urgent bilateral orchidopexy .
- The testis should be explored soon if testicular torsion has been diagnosed and the symptoms have been present for >24 h.
- If symptoms have been present for >12 h and clinically diagnosed of testicular torsion, $\approx 75\%$ of these testes will be necrotic.
- A single testis, for whatever reason, should be fixed; suture-less fixation using the dartos pouch technique is the preferred method.
- A misdiagnosis of testicular torsion leading to an unnecessary 'scrotal exploration' does not lead to medical litigation.
- A patient who has a testicular torsion misdiagnosed and loses a testis may proceed to successful medical litigation.

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