Uveal Melanoma

Executive summary

Updated 2022

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Providing support and information for patients, carers and healthcare professionals while commissioning and funding innovative research.

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1 How to use this guideline

The Melanoma Focus guideline for Uveal Melanoma (UM) was first started in 2012 and published in 2015. A review and update of parts of the guideline was started in 2020 and completed in 2022. Sections where practice or treatment had changed to such an extent that the 2015 recommendations were out-of-date, were identified and updated. This is the Executive summary that includes all of the recommendations and the care pathway. Recommendations are listed in the order of the patient pathway. Original recommendations are marked [2015] and updated or new recommendations are marked [2022]. There is a glossary and table of abbreviations at the end of the document.

All of the further material is available here https://melanomafocus.org/for-professionals/rare-melanoma-guidelines-and-consultations/uveal-melanoma-guidelines/ . This includes:

- the Full guideline containing the background information, methodology, evidence reviews and details of the Guideline Development Group (GDG)
- the Care Pathway
- the Appendices with the evidence tables, search strategies and other background information from 2022 and 2015
- information for patients
- a Power Point slideset is also available for use at clinical meetings
- the comments from consult and the Guideline Development Group's (GDG) replies

2 Recommendations

2.1 Patient information and support [2022]

1. **Information should be offered throughout the patient pathway in an individualised manner and provided as needed. Ideally, this should adhere to these quality standards (https://pifonline.org.uk/pif-tick/). [2022]**

2. **Patients should be encouraged to record their consultations, with the knowledge of the clinician and staff. [2022]**

3. **Patients should be given the time and opportunity to discuss their condition and treatment on each visit. This should include:**
   - **risks and benefits of investigations, procedures and treatments**
   - **the treatment options available locally and at other centres**
   - **the 'pros' and 'cons' of prognostication, including the role of tumour biopsy**
   - **timely information on the roles of other teams in their care**
   - **signposting to other high-quality resources, for example Melanoma Focus, OcuMel UK, Cancer Research UK, MacMillan and Maggie's. [2022]**

4. **Each patient should have a named keyworker, with contact details including telephone and e-mail address, who is responsible for communication between the different cancer centre teams caring for the patient and between the cancer centre and primary and secondary care. Ideally, this should be a Clinical Nurse Specialist. [2022]**

5. **Patients should be given scan results as early as possible to mitigate anxiety. [2022]**

6. **Standard care available to all patients nationwide should include:**
   - **information on the side effects of local or systemic treatment**
   - **advice for patients and families regarding signs and symptoms that may indicate that the cancer has recurred**
   - **the offer of psychological support**
   - **easy access to out-patient review or remote consultation**
   - **the opportunity to have a family member with them at consultations. This may be done remotely, if necessary**
   - **the offer of early referral to services, for example, enhanced supportive care, palliative care support services and support groups. [2022]**

2.2 Service configuration (2015)

7. **A coordinated approach for the care and follow-up of all patients with uveal melanoma should be established by the Multi-Disciplinary Team (MDT). The MDT should make recommendations on an**

individual patient's tumour staging and management, and have available all treatments and trials locally or by referral. For advanced disease, the specialist oncology MDT should consist of a medical or clinical oncologist, a diagnostic radiologist, histopathologist and a clinical nurse specialist. Membership by, or referral pathways to, an interventional radiologist and hepatobiliary surgical unit with experience in treating metastatic uveal melanoma are also a requirement. MDTs should have direct links to ocular surgical oncology centres. {2015/2021 – The wording has been clarified better to reflect the original intent.]

8. **Any molecular testing should be carried out within an accredited molecular pathology laboratory with appropriate quality assurance in place, to provide the required standards and experienced interpretation of the diagnostic test, in compliance with national requirements. [2015]**

9. **A national register, based on a standardised minimum data set, should be established where details of every patient with a diagnosis of uveal melanoma are entered, with follow-up data collected contemporaneously if possible, and at least annually. [2015]**

2.3 General Guidance (2015)

10. **All local recurrences of the primary uveal melanoma should be reported to the surgical ocular oncology centre where treatment for the primary tumour took place. [2015]**

11. **All Optometrists and Ophthalmologists should receive training in the recognition of uveal melanoma, in order to allow earlier detection and timely referral of patients with uveal melanoma. [2015]**

12. **Each surgical ocular oncology centre should audit their results and share them nationally. [2015]**

13. **Following identification of a suspected uveal melanoma the referring clinician should urgently refer to the ocular oncology centre. According to national targets the patient needs to be seen and treated within 62 days. [2015/2021 – The wording has been clarified better to reflect the original intent.]**

14. **Suspicious lesions or lesions diagnosed as uveal melanoma should be referred to a consultant surgical ocular oncologist in one of the surgical oncology centres for ocular malignancies. [2015]**

15. **Tumour specimens should be reported by an ophthalmic pathologist within a specialist centre, or by one registered and taking part in annual ophthalmic pathology External Quality Assurance schemes. [2015/2021 – The wording has been clarified better to reflect the original intent.]**

16. **All patients with a new diagnosis of uveal melanoma should be offered referral to a medical or clinical oncologist with a specialist interest in the disease. [2015]**

17. **Patients should be informed about and recruited into clinical trials wherever possible. [2015]**

18. **Patients should be offered the opportunity to participate in uveal melanoma specific research. With patient consent and in compliance with national requirements, samples should be taken**

surplus to diagnostic requirements and stored in an ethically-approved quality biobank for research purposes. [2015/2021 – The wording has been clarified better to reflect the original intent.]

2.4 Primary management (2015)

Pre-operative investigations (2015)

19. Make a diagnosis of uveal melanoma using ophthalmoscopy, fundus photography and conventional ocular ultrasound. [2015]

20. Ciliary body melanoma should be imaged with Ultrasound Biomicroscopy (UBM) or anterior segment Optical Coherence Tomography (OCT). [2015]

21. If the clinical diagnosis is uncertain following the above-mentioned techniques, then diagnostic biopsy should be considered and balanced against potential risks of the procedure. [2015]

22. Fine needle aspiration biopsy can be performed either with a direct transcleral approach or using a transvitreal approach. [2015]

Radiological Staging before primary treatment

23. A decision on staging should be made based on the individual circumstances of the patient, but staging should not delay the primary management of the tumour. [2015]

24. Staging should be considered in the following circumstances:

- **The patient is at particularly high risk because of the clinical features of their presentation.**
- **The patient is particularly anxious and requires reassurance. [2015]**

Treatment of the primary tumour [2015]

25. Patients should be informed that there is no proven survival advantage between any of the offered modalities. {2015]

26. Treat patients using Table 1 below [2015]

Table 1 Treatment	Used for	Outcomes	Complications	Comments	Grade
RADIOTHERAPY					
Brachytherapy Ruthenium 106 Iodine 125	Small/Medium /Large uveal melanoma* <20mm in basal diameter	Good local tumour control	Loss of vision Tumour recurrence	Dose and position of plaque can be adjusted to limit the loss of vision	A
Proton Beam radiotherapy	Medium to Large uveal melanoma which cannot be treated with brachytherapy or resection	Good local tumour control	Loss of vision Loss of the eye from neovascular glaucoma Tumour recurrence	Not available in all ocular oncology units	C
Stereotactic radiosurgery	Juxta-papillary uveal melanoma ; patients unsuitable for ruthenium plaque or unfit for surgery	Good local tumour control	Loss of vision Radiation related complications Tumour recurrence	Not available in all ocular oncology units	C
PHOTOTHERAPY					
Transpupillary thermotherapy	Local recurrence and adjuvant therapy of uveal melanoma	Improves local tumour control	Loss of vision Extraocular tumour recurrence	Very occasionally used by some centres for small melanoma nasal to the optic disc. When considering preservation of vision, for example in a one eyed patient; as it avoids radiotherapy complications. However, it is no longer recommended routinely as a sole primary treatment.	C
Photodynamic therapy	Small melanoma	Uncertain	Tumour recurrence	Avoids radiotherapy complications New treatment option not widely used for uveal melanoma. This is an experimental treatment.	D
SURGERY					

Exoresection +/- plaque	Medium to large melanoma with a narrow basal diameter	Variable	Retinal detachment Loss of vision Loss of the eye Tumour recurrence Risk of orbital dissemination of tumour	Rarely performed in the UK. Only performed in limited centres. Always performed with brachytherapy to reduce the risk of recurrence	C
Endoresection +/- radiotherapy	Medium-sized uveal melanoma. Toxic tumour syndrome post PBR	Variable	Transient intraocular haemorrhage; Rarely tumour seeding	Only performed in a few centres in the UK	D
Enucleation	Large uveal melanoma Melanoma associated with NVG +/- extensive retinal detachment	100% local tumour control if completely excised	Socket related complications Orbital recurrence	Cosmetic results are reasonably good with an orbital implant and artificial eye	A
Exenteration	Large extra-ocular extension after uveal melanoma	100% local tumour control if completely excised	Orbital recurrence	Rarely performed in the UK.	D

Follow-up after primary treatment [2015]

27. Patients treated with plaque brachytherapy, proton beam radiotherapy or stereotactic radiotherapy should be monitored for tumour regression intensively over the first two years following treatment. Long-term follow-up intervals depend of the response of the tumour to brachytherapy and the radiotherapy complications experienced. [2015]

2.5 Genetic and molecular features [2022]

Prognostic factors/tool

28. Prognostic factors of uveal melanoma are multi-factorial and include clinical, morphological and genetic features. The following features should be recorded:

- **Patient age**

- **Patient sex**
- **Tumour location**
- **Tumour height**
- **Tumour largest basal diameter**
- **Ciliary body involvement**
- **Extraocular melanoma growth (macroscopic and microscopic).**

The following features should be recorded if tissue is available:

- **Cell type (modified Callender system)**
- **Mitotic count (number/40 high power fields in H&E-stained sections)**
- **Presence of extravascular matrix patterns (particularly 'closed loops')**
- **Presence of extraocular melanoma growth (size in mm; presence/absence of encapsulation; relation to surgical margin)**
- **Positive or negative expression of nuclear BAP1 protein in the tumour cells. [2022]**

29. The following features should be recorded if cytology of tumour is available:

- **Confirmation of melanoma cells (i.e., exclude differential diagnoses, particularly metastatic carcinoma) – immunocytology may be required for this, but is not always necessary.**
- **Cell type (modified Callender system), if possible. [2022]**

Prognostic biopsy

30. There should be a fully informed discussion with all patients, explaining the role of biopsy including the benefits and risks. The discussion should include:

- **Enabling prognostication and allow tailored follow-up**
- **Allowing recruitment into adjuvant trials**
- **Risks of having the biopsy**
- **Limitations of the investigation**
- **Effects of prognostication information on quality of life. [2022]**

31. The minimum dataset for uveal melanoma from the Royal College of Pathology (or national official equivalents) should be recorded in the pathology reports. See: https://www.rcpath.org/profession/publications/cancer-datasets.html [2022]

32. Use the most up-to-date edition of the TNM staging system for prognostication and include in pathology/clinical reports. [2022]

33. Collect molecular genetic and/or cytogenetic data for research and prognostication purposes, where tumour material is available and where patient consent has been obtained, as part of an ethically-approved research programme. [2022]

34. The use of multifactorial prognostication models incorporating clinical, histological, immunohistochemical and genetic tumour features should be considered. [2022]

35. Where available the results of state-of-the-art molecular analysis should be combined with clinical features and standard anatomical and pathological staging for prognostication. [2022]

36.Tests for novel circulating blood-borne biomarkers should only be used within clinical trials or research programmes. [2022]

2.6 Adjuvant therapy [2022]

Systemic adjuvant therapy after surgery

37. The availability of prognostic tools that allow identification of high-risk primary disease and the poor outcomes for metastatic uveal melanoma support an adjuvant approach. In the absence of proven therapy, adjuvant systemic therapy should only be given within a well-designed clinical trial. [2022]

Radiation therapy as adjuvant treatment to the orbit

38. There is very limited evidence for adjuvant radiation therapy to the orbit after definitive surgical treatment of primary disease. It is an option that can be considered for patients deemed to be at high risk of local relapse (e.g., greater than 5mm tumour extra-ocular extension in enucleation samples). Toxicity should be balanced against lack of evidence for efficacy and patients should be counselled on the benefits and risks of radiation therapy. [2022]

39. When radiation therapy is indicated, due to the relative radio resistance of melanoma, doses greater than 2Gy per fraction are recommended with a total does of 45-50Gy/20#. [2022]

2.7 Surveillance of patients at risk of recurrence [2015]

NOTE: THIS SECTION IS BEING UPDATED AS A SEPARATE PIECE OF WORK

40. Prognostication and surveillance should be led by a specialist multidisciplinary team that incorporates expertise from ophthalmology, radiology, oncology, cancer nursing and hepatic services. [2015]

41.Prognostication and risk prediction should be based on the best available evidence, taking into account clinical, morphological and genetic cancer features. [2015]

42. All patients, irrespective of risk, should have a holistic assessment to discuss the risk, benefits and consequences of entry into a surveillance programme. The discussion should consider risk of false positives, the emotional impact of screening as well as the frequency and duration of screening. An individual plan should be developed. [2015]

43. Patients judged at high-risk of developing metastases should have 6-monthly life-long surveillance incorporating a clinical review, nurse specialist support and liver-specific imaging with a non-ionising modality. [2015]

44. Liver function tests alone are an inadequate tool for surveillance for uveal melanoma metastases. [2015]

2.8 Treatment options for macroscopic orbital recurrence

45. For local macroscopic recurrence in the orbit, there should be a discussion at MDT to discuss surgical and radiotherapy options. [2022]

46. When radiation therapy is indicated, due to the relative radio resistance of melanoma, doses greater than 2Gy per fraction are recommended with a total does of 45-50Gy/20#.

2.9 Metastatic disease (2015 & 2022)

Staging [2015]

47. The burden of liver disease should be assessed by contrast enhanced diffusion-weighted MRI scan. [2015]

48. Contrast-enhanced CT of chest, abdomen and pelvis and/or PET/CT scan should be used to stage extrahepatic disease. [2015]

49. Brain imaging should not be carried out in the absence of symptoms. [2015]

50. Patients who have symptomatic bony pain should have a bone scan to assess the presence of bony disease. [2015]

Prognostic method [2015]

51. This minimum data set should be collected for all patients with systemic disease (Stage IV) for future validation:

- **Metastatic Tumour Burden (site, diameter and number)**
- **LDH**
- **ALP**
- **GGT**
- **Bilirubin**
- **Presence or absence of ascites**
- **Sex**
- **Age**
- **Performance status,**

- **DFS following definitive primary therapy. [2015]**

52. A biopsy should be performed to confirm the diagnosis of metastatic uveal melanoma unless contraindicated. [2015 – edits to wording for clarification 2022]

Systemic therapy [2022]

53. Pending licencing and availability consider offering tebentafusp to HLA-A*02:01 positive fit patients with metastatic disease. [2022]

54.Patients should be considered for clinical trials wherever possible and be informed of available trial options at other centres. [2022]

55. Patients with good performance status (PS 0-2) who decline trials or for whom no suitable clinical trials are available should be offered systemic treatments and managed in specialist centres with appropriate oncology expertise in uveal melanoma. [2022]

56. Specialist centres should be involved in treatment decisions and review, but a patient may prefer to receive supportive care and systemic treatment locally if possible. [2022]

57.Systemic immune checkpoint inhibitors (ICI) can be considered in the absence of relevant clinical trials. Without clear evidence of superiority, treatment decisions between single agent and combination ICI require careful discussion regarding the risk of significant toxicity and modest potential additional benefits. [2022]

58. For patients with liver only or liver predominant disease, local or locoregional therapy may also be considered. [2022]

59. Chemotherapy has limited, if any, efficacy in uveal melanoma, and as such should only be used in the absence of other options and with full discussion of risks and impact on quality of life. [2022]

60.Targeted therapy should only be used in the context of a clinical trial. [2022]

Impact of molecular features on choice of therapy [2022]

61. Screen fit patients for HLA-A*02:01 to identify those who may benefit from tebentafusp. [2022]

62. Bio-banking and similar efforts in UM should conform to agreed best practices that ultimately could allow for pooling of molecular and clinical data collected in clinical trials and routine care to maximise the likelihood of successfully validating predictive biomarkers. [2022]

Loco-regional management of hepatic predominant disease [2022]

63. For patients with technically resectable disease, assessment for hepatic resection should be offered where complete macroscopic clearance (RO) can be achieved. [2022]

64. Patient selection to ensure complete macroscopic clearance is important to exclude surgery without benefit, including consideration of early interval imaging, in order to exclude rapidly emerging disease. Patent selection should consider these criteria:

- **The extent of liver involved with tumour**
- **No more than one site of extra-hepatic disease which is either stable or with an alternative treatment strategy for that site**
- **ECOG PS >= 1**
- **Functionally significant underlying liver disease. [2022]**

65. Laparoscopic assessment should be performed in patients with radiologically resectable liver metastases, as many of these patients will have a miliary pattern of disease. [2022]

66. Liver directed and/or systemic treatments should be considered in selected patients with liver dominant disease where resection is not suitable. [2022]

Surveillance following liver treatment [2015]

67. Patients treated with curative intent should be followed with regular (3-4 monthly) hepatic MRI and CT of chest, abdomen and pelvis. [2015]

68. Patient outcomes for this selected group should be collected centrally and prospectively. [2015]

3 Care pathway

The Care Pathway is available here https://melanomafocus.org/wp-content/uploads/2022/05/care-pathway.pdf

4 Research recommendations

1. **Validation of existing staging systems for metastatic disease**

2. **Comparative studies of prognostic algorithms**

3. **Comparative studies of molecular tools supporting precision medicine.**

4. **Investigation of circulating blood-borne biomarkers in a research or clinical trial setting.**

5. **High quality clinical trials of adjuvant treatment with associated bio-banking for translational research**

6. **Audit of all patients with pathological evidence of extra-ocular extension treated (or not) with orbital radiation therapy is recommended.**

7. **Clinical studies, biobanking, and/or participation in patient registries for all patients.**

8. **Genetic studies are required to examine the differences between indolent nodular and aggressive diffuse iris melanomas.**

5 Glossary and Abbreviations

Glossary

Anti-angiogenic	Inhibiting the formation and differentiation of blood vessels.
Ascites	Accumulation of fluid in the spaces between tissues and organs in the abdomen
Brachytherapy	Targeted radiotherapy when the radiation is placed in or near to the tumour.
Choroid	A vascular membrane between the retina and the sclera of the eye containing large branched pigment cells.
Choroidectomy	Removal of choroidal melanomas.
Ciliary body	A ring of made up mainly of muscle on the inner surface of the front wall of the eye. Consists of the ciliary body and ciliary processes, and is responsible for providing the fluid that nourishes the the lens and cornea of the eye.
Computed Tomography (CT)	A method to use X-rays to give a high resolution pictures of the inside of the body.
CyberKnife	A particular brand of equipment to deliver stereotactic radiosurgery (SRS).
Cyclectomy	Removal of small, ciliary body tumours.
Debulking	Removal of most or all of the tumour, thus reducing the size.
Embolisation	Introduction of pellets into the circulatory system in order to occlude blood vessels supplying the tumour.
Endoresection	The surgical removal of part of an organ or tumour from within.
Enucleation	Removal of the eye.
Exoresection	Removal of the tumour ‘en bloc’ through a large sclera opening.
Extrahepatic	Outside of the liver (commonly used for metastasis outside of the liver).
Exudative retinopathy	Damage to the retina caused by serum, fibrin (involved in blood clotting), and white blood cells leaked from blood vessels into the retina. Fibrin is an insoluble protein in response to bleeding and is the major component in a blood clot.
Fractionate	Splitting of a whole into different parts.
Fractionated stereotactic radiation treatments/therapy	Treatments of moderately high doses of radiation usually given over three to eight sessions (fractions).
Fundus of the eye	The interior surface of the eye, opposite the lens. It includes the retina, optic disc, macula and fovea, and posterior pole.
GammaKnife	A particular brand of equipment to deliver stereotactic radiosurgery (SRS).
Hepatomegaly	Enlargement of the liver.
Hypofractionated radiotherapy treatment	Radiation treatment split into large doses per timepoint (fraction) but giving less treatment doses (fractions) than with standard fractionation. A particular way to improve efficacy of radiation treatment.
Intraocular	Located within the eye.

Intraocular haemorrhage	Bleeding within the eye.
Iridectomy	Removal of the iris or parts of the iris to treat iris melanoma.
Iris	A thin, circular structure in the eye, responsible for controlling the diameter and size of the pupil and thus the amount of light reaching the retina.
Ischaemia	A reduction of blood supply resulting from the blocking of an artery.
Laproscopy	Looking inside of the abdomen using a laparoscope.
Magentic Resonance Imaging (MRI)	A non-invasive diagnostic technique that produces computerized images of internal body tissues. It uses magnetic signals rather than X rays.
Miliary spread of melanoma	A large number of small nodules of melanoma that resemble grains of small seeds (of millet).
Monosomy 3	Loss of part of or of the whole of one of the two chromosomes three in cancer cells. Monosomy 3 is present in some uveal melanomas and then is linked with development of metastases and an increased risk of dying from uveal melanoma.
Neovascular glaucoma	The abnormal production of new blood vessels causing increased pressure in the eye.
Oedema	Swelling caused by fluid accumulating particularly in the abdomen.
Ophthalmoscopy	A visual examination with an instrument to look inside of the eye. The instrument is called an ophtalmoscope. Usually an uveal melanoma can be seen by ophthalmoscopy.
Parenchyma	The functional part of an organ such as the liver.
Pars plana	Translates as ‘flat part’ – the outer ring of the ciliary body.
Pars plana vitrectomy	Surgical removal of vitreous body from the eye, with introduction of the instruments via the pars plana of the ciliary body.
Percutaneous	Translates literally as ‘through the skin’. Used to describe a medical procedure where inner organs are accessed by needle-puncture of the skin, rather than by using an "open" approach where inner organs or tissue are exposed (typically with the use of a scalpel).
Percutaneous ablative techniques	Removal or destruction of metastases using a percutaneous approach. This is usually the case for microwave and radiofrequency ablation or cryothearapy.
Plaque therapy	A form of radiation therapy where a radioactive patch (plaque) is placed on or near the tumour from the outside of the eye for a period of time.
Porta hepatis	Also called the transverse fissure of the liver. It is a short fissure that extends across the under surface of the left portion of the right lobe of the liver. It contains a number of important structures of the liver (hepatic portal vein, hepatic artery proper, Common hepatic duct).
Proton beam therapy	A type of radiation treatment. Beams of particles, called protons, are aimed at the cancer bearing part of the eye.

R0 resection	Surgery at which a primary tumour or metastasis this is removed completely. No tumor is found at the edges (margins) of the removed tissue when examining the tissue under the microscope.
R1 resection	Surgery at which a primary tumour or metastasis this is removed as far as the eye can see. Under the microscope the tumour reaches the edges (margins) of the removed tissue.
R2 resection	After surgery visible residual tumour following is left behind.
Radiogenic retinopathy	Long term damage of the retina caused as a side effect of radiation treatment.
Resectable	When surgical removal of the tumour is possible.
Retina	The light-sensitive layer of tissue, lining the inner surface of the eye.
Retinopexy	A procedure to seal the retina to the surface beneath to stop it detaching.
Retinotomy	A surgical incision through the retina.
Sclera	The tough white outer layer of the eyeball.
Stereotactic	A technique for precisely directing the tip of a delicate instrument (as a needle) or multiple beams of radiation in three dimensions at a tumour or other lesion.
Stereotactic Radiosurgery	A one-session of high dose radiation using stereotactic methods. Like all radiotherapy is works by reducing or destroying the ability to the tumour to grow. There are three types Particle beam (proton) Cobalt-60 based (photon) e.g., Gamma Knife Linear accelerator based (linac) e.g Cyber Knife It can be used to treat parts of the body that can remain or be hel absolutely still during the treatment.
Stereotactic resection	The removal of the tumour using microsurgery with the aid of the stereotactic techniques.
Surgical Ocular Oncology Centre	One of three treatment centres in the UK that have nationally recognised expertise for the treatment of eye cancer including uveal melanoma. They are centrally funded through government.
Thermotherapy	The use of heat to treat a tumour.
Transcatheter arterial chemoembolization / Transarterial Chemoembolization (TACE)	Injection of small particles coated with chemotherapeutic drugs directly into an artery supplying a tumour. This restricts the tumour's arterial blood supply and delivers chemotherapy directly to the target tissue.
Tumour seeding	Spreading of cancer cells from the place the cancer started (primary) to another part to other parts of the body. This can be close to the primary (for example, in the eye) or distant (for example, the liver).
Uvea	The middle layer of the eye including the iris and ciliary body as well as the choroid.
Vitreous body	The clear jelly-like structure that fills the posterior part of the eyeball.
Vitreous haemorrhage	Bleeding into the vitreous body.

Abbreviations

AJCC	American Joint Committee on Cancer
ALP	Alkaline phospatase
BAC	Best Available Care
BCNU	Carmustine (bis-chloroethylnitrosourea)
CNV	Copy Number Variants
CT	Computed Tomography
CGE	Cobalt Gray Equivalent
DFS	Disease free survival
DTIC	Trade name for Dacarbazine
DWI	Density weighted imaging
ELND	Elective Lymph Node Dissection
FISH	Fluorescence In Situ Hybridization
FNAB	Fine Needle Aspiration Biopsy
fSRT	Fractionated Stereotactic Radiation Therapy
HAI	Hepatic intra-arterial
IE or CE	Immunoembolization/Chemoembolization
IFN or INF	Interferon Alfa-2b
IHP	Isolated Hepatic Perfusion
IL-2	Interleukin-2
IND	Investigational New Drug
Intron-A	Interferon Alfa-2b
LDH	Lactate Dehydrogenase
LFT	Liver Function Test
LUMPO	Liverpool Uveal Melanoma Prognosticator Online
MFS	Metastatic Free Survival
MRI	Magnetic Resonance Imaging
mUM	Metastatic Uveal Melanoma
NED	No Evidence of Disease
NVG	Neovascular Glaucoma
OCT	Optical Coherence Tomography
ORR	Overall Response Rate
OS	Overall Survival
PICO	Population Intervention/investigation Comparator Outcomes
PBR	Proton Beam Radiotherapy
PET	Positron Emission Tomography
PFS	Progression Free Survival
PHP	Percutaneous Hepatic Perfusion
RCT	Randomised control trials
RECIST	Response Evaluation Criteria in Solid Tumours
RFA	Radiofrequency Ablation
SIRT	***Selective Internal Radiation Therapy***
SLN	Sentinel Lymph Node
SNB or SLNB	Sentinel Node Biopsy/Sentinel Lymph Node Biopsy
SRS	***Stereotactic Radiosurgery***

TACE	Transcatheter Arterial Chemoembolization/ Transarterial Chemoembolization
TNF	Tumour Necrosis Factor
TNM	Tumor Node Metastasis staging system
UBM	Ultrasound Biomicroscopy
US	Ultrasound
WLE	Wide Local Excision

	Table of Genetic Abbreviations
ATF1	Activating Transcription Factor 1
BAP1	BRCA1-associated protein-1
CASP3	Caspase-3 Protein
CD164	Sialomucin core protein 24 also known as endolyn or CD164 (cluster of differentiation 164)
CDH1	Cadherin 1
CTLA4	Cytotoxic T-Lymphocyte Associated Protein 4
CYSTLR2	Cysteinyl Leukotriene Receptor 2
dMMR/MSI-H	Deficient mismatch repair
EIF1AX	Eukaryotic Translation Initiation Factor 1A X-Linked
GDF-15	Growth/differentiation factor-15
GNA11	G Protein Subunit Alpha 11
GNAQ	G Protein Subunit Alpha Q
HLA-A*02:01	Human Leukocyte Antigen- A*02:01
HLA-DRB4	HLA-DRB4 (Major Histocompatibility Complex, Class II, DR Beta 4)
HLA-G	HLA-G (Major Histocompatibility Complex, Class I, G)
IFITM2	Interferon Induced Transmembrane Protein 2
ITCH	Itchy E3 Ubiquitin Protein Ligase
LAG3	Lymphocyte Activating 3
MAGE	Melanoma Antigen Gene
MAPK	Mitogen-Activated Protein kinase
MBD4	Methyl-CpG Binding Domain 4, DNA Glycosylase
MBD4	Methyl-CpG-binding domain 4
Melan-A/ MART-1	MART-1/melan-A is a protein antigen that is found on the surface of melanocytes
MIA-1	Melanoma inhibitory activity-1

MLH1	MutL homolog 1
mTOR	mammalian target of rapamycin
NY-ESO	New York esophageal squamous cell carcinoma 1
PALB2	Partner And Localizer Of BRCA2
PD-L1	Programmed death-ligand 1
PI3K	Phosphoinositide 3-kinases
PKC	Protein kinase C
PLCB4	Phospholipase C Beta 4
PRAME	PReferentially expressed Antigen in MElanoma
S-100B	S100 calcium-binding protein B
SF3B1	Splicing factor 3b subunit 1
SLAMF1	Signaling Lymphocytic Activation Molecule Family Member 1
SOCS1	Suppressor Of Cytokine Signaling 1
TBK1	TANK Binding Kinase 1
TLR3	Toll-like receptor 3
TPS	Trehalose-6-phosphate synthase (TPS)