CONSENSUS STATEMENT ON METASTATIC SURVEILLANCE FOR UVEAL MELANOMA IN SCOTLAND

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    PARTCIPANTS OF OCULAR ONCOLOGY MDT AT GLASGOW

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    LOGISTICS OF SURVEILLANCE FOR METASTASES FROM UVEAL MELANOMA IN SCOTLAND

TERMS OF REFERENCE

Purpose: To develop a consensus on a metastatic surveillance protocol for patients diagnosed with uveal melanoma in Scotland.

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Methodology:

1. Terms of Reference accepted by all committee members
2. Outline of issues circulated amongst committee; Review of scientific literature
3. Drafting of first version of consensus statement
4. Meeting of committee members to discuss all aspects of the statement
5. Second version of statement drafted and circulated
6. Any further comments from committee members incorporated
7. Final version of Statement drafted and approved by committee
8. Consensus statement sent to National Services Division

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Update: This document shall be updated in 2024.

EXECUTIVE SUMMARY

1. There is a lack of evidence and a lack of consensus across the United Kingdom regarding specifics of metastatic surveillance for uveal melanomas. A consensus amongst the clinicians involved in the management of uveal melanoma in Scotland will ensure uniformity of approach for these patients in Scotland.

2. Early detection of these metastatic lesions may facilitate both standard and clinical trial based treatment options .

3. It is good practice to offer all patients with uveal melanoma 6-monthly surveillance for liver metastases for the first 10 years after diagnosis. After 10 years, the decision on continuing surveillance should be made after a discussion between the patient and the clinician.

4. In low-risk uveal melanomas, this surveillance should be performed by offering serial liver ultrasounds. If any suspicious lesions are seen on the liver ultrasound, an MRI scan with contrast (unless contraindicated) should be performed to further characterise the lesion. The suggested surveillance protocol is given in Appendix 4.

5. In high-risk uveal melanomas, this surveillance should be performed by offering serial MRI imaging of the liver. Serial ultrasound imaging may be considered as an alternative modality if the operator has experience of its use in uveal melanoma metastatic disease. The SCSG has defined high-risk melanomas in Appendix 3. The suggested surveillance protocol for Scotland is given in Appendix 4.

6. The surveillance plan should be individualised for each patient and discussed at the multi-disciplinary meeting (MDT) at the time of diagnosis. This can be periodically reviewed as required.

INTRODUCTION

Uveal melanoma is a rare tumour with an incidence of approximately 2-8 per million per year in Caucasians[1]. More than 90% involve the choroid, the remainder being confined to iris and ciliary body[2]. Both sexes are affected in equal numbers[3]. The age at presentation peaks at approximately 60 years, except for iris melanomas, which usually present at a younger age.

All suspected uveal melanomas in Scotland are referred to The Scottish Ocular Oncology Service (SOOS) which is based at Gartnavel General Hospital, Glasgow. The patients undergo a complete ocular examination and investigations to arrive at a clinical diagnosis. A management plan is formulated in conjunction with the patient and then discussed at the weekly multi-disciplinary team meeting (which has representation from ocular oncology, clinical radiology, histopathology, clinical oncology and specialist oncology nurses; see Appendix 5). The treatment modalities offered for uveal melanoma at the SOOS include ruthenium plaque brachytherapy, proton beam therapy (in conjunction with the Clatterbridge Cancer Centre), enucleation, external beam post-operative radiotherapy, photodynamic therapy, transpupillary thermotherapy and surgical resection of the melanoma.

Staging for uveal melanoma follows the American Joint Committee on Cancer (AJCC 8th Edition) Tumor-Node-Metastasis (TNM) staging system for eye cancer[4,5]. Outcomes for patients with uveal melanoma vary widely, but are better for patients with smaller tumours. In a cohort of 8033 patients, the 10-year metastatic rate for a 1-mm-thick uveal melanoma was 5%, for a 2-mm-thick uveal melanoma was 10%, and for a 6-mm-thick uveal melanoma was 30%[6]. When grouping 7621 uveal melanomas into small (0-3mm thick, 29.8%), medium (3.1-8 mm thick, 49%) or large (>8 mm thick,

20.9%) tumours, the 10-year rates of detecting metastases were 11.5%, 25.5% and 49.2% respectively[6]. The AJCC stage specific survival rates have been studied by Kujala et al and then validated by the AJCC Ophthalmic Oncology Task Force. The 5-year survival rate ranges from 96-97% for Stage I to 25-26% for Stage IIIC[5,7].

CURRENT UVEAL MELANOMA GUIDELINES

A group of experts from England were supported by 'Melanoma Focus' to develop the Uveal Melanoma Guidelines[8] which were published in January 2015. These were subsequently approved by NICE. There was no representation from the Scottish Ocular Oncology Service in the discussions that led to the development of this document. The aim of these guidelines was to optimise patient care by providing recommendations based on the best available scientific evidence. These guidelines assist the planning of patient care and provide an indication of the likely clinical outcomes, as well as facilitating patient counseling and informed decision-making. Adequate evidence was found lacking in a number of areas and, in these situations, the guideline development group (GDG) arrived at an expert consensus where possible. The Group, however, recognised that each patient is an individual and the guidelines clearly stated that they 'should therefore neither be prescriptive nor dictate clinical care'.

As part of the guidelines, the GDG addressed the issue of surveillance and performed an extensive search of literature to gather evidence on the issue. The GDG concluded that some of the evidence in the literature appeared to suggest that offering surveillance to all patients may be futile. However, there was a consensus supporting the concept of conducting surveillance with an emphasis on liver screening. It recommended that all patients,

irrespective of risk, should have a holistic assessment to discuss the risk, benefits and consequences of entry into a surveillance programme.

The GDG was unable to agree on a definition of high metastatic risk and therefore did not give any opinion regarding a risk adapted strategy for surveillance. It was recognised that some centres employ MRI with or without contrast in 'high-risk' uveal melanoma while others indicated that they would remain with the initial hepatic assessment using ultrasound and only progress to other modalities when the ultrasound detected an abnormality. Consensus was achieved amongst the GDG for lifelong six monthly liver screening in all melanoma patients despite the lack of evidence in the literature supporting this practice. It recommended that 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 by a non-ionising modality.

It is apparent from the above guidelines that there was a consensus amongst the group that there was inadequate evidence to be prescriptive about the recommended modality for surveillance. These guidelines seem to have been interpreted by various clinicians, patients and patient groups in different ways and surveillance continues to be performed variably across the United Kingdom. In Scotland, a petition was filed in December 2016 (http://www.parliament.scot/GettingInvolved/Petitions/PE01629) which claimed that MRIs were being offered as a surveillance modality in all centres across the UK except Scotland. Despite multiple attempts to clarify this situation and clear indications from other centres that this is not the case (personal correspondence of one of the authors PC; Minutes of CQUIN meeting, Liverpool, 2018) there seems to be a continuing belief in this view and the petition proceedings are still continuing. This consensus statement is an attempt to achieve consensus across Scotland regarding surveillance

planning. The Scottish Consensus Statement Group (SCSG) has included members from England and a patient representative.

The group statement does not intend to replace the NICE-accredited Uveal Melanoma National Guidelines published in January 2015 and due to be updated in 2020. This statement should be seen as complementary to the above guidelines.

METASTATIC UVEAL MELANOMA

The relative 5-year survival of uveal melanoma has been reported to remain unchanged in the past three decades[9]. The Collaborative Ocular Melanoma Study (COMS) Group found that the rates of metastatic disease at 5 and 10 years after diagnosis were 25% and 34%, respectively[10]. Survival drops off significantly once metastatic disease is present. One-year overall survival of patients with metastases is reported to be 15-43%, with reported median survival ranging from 4 to 15 months[11-14].

Iris melanomas are at the lowest risk of metastasising and have the best prognosis[15]. Ciliary body location is known to be a poor prognostic factor and this aspect has been incorporated in the AJCC (8th Edition) staging of posterior uveal melanomas.

The most common site of metastasis is the liver, with liver lesions present in 77–94% of patients with metastatic disease[10,16-18]. Other common sites of metastasis include lung and bone. Once uveal melanoma metastasizes, the median survival is only 2 months without treatment[6]. Even with treatment, the median survival is still typically less than one year[10,14,16,17]. Liver involvement is the cause of death in most patients with metastatic uveal melanoma[19].

Chemotherapeutic agents for systemic metastases from uveal melanoma have shown disappointing results[20]. Ipilimumab, a human monoclonal antibody that blocks the cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4) has been used as systemic therapy with response rates of 5-10% reported[20]. Nivolumab and pembrolizumab, fully human monoclonal antibodies targeting the programmed cell death 1 (PD-1) receptor have also been used but have once again shown low response rates, possibly because of the very low rates of PD-1 and PD-L1 expression in uveal melanoma[21]. This is likely to be secondary to relative lack of immune infiltrate and mutational blandness of UM

Liver disease is usually multifocal, sometimes in a miliary distribution, but some patients may develop oligometastatic metastases enabling surgical removal[22,23] which has been reported to be associated with prolonged survival. Other targeted therapies such as radiofrequency ablation (RFA)[23] and selective internal radiotherapy (SIRT)[21] have also been used in patients with limited liver metastases. Recently there has been interest in percutaneous hepatic perfusion of melphalan[25,26] . Despite a multi-centre study concluding that it can be part of an integrated multimodality treatment approach in appropriately selected UM patients[26], randomized data not confounded by crossover are unavailable.

A detailed discussion of treatments for metastatic UM is beyond the scope of this statement and has recently been reviewed by various groups. Carvajal et al in their review concluded that there is no standard of care for the treatment of metastatic disease nor has any therapy been shown to improve overall survival[20].

Similarly, Yang et al also reviewed the treatments for metastatic melanoma and concluded that outcomes of patients with metastatic disease remain

poor. Comparing these with cutaneous melanoma, they felt that the therapeutic advances that have translated to improved patient survival in cutaneous melanoma have unfortunately not yielded similar benefits in advanced uveal melanoma[21].

Kinsey and Salam's review concluded that metastatic uveal melanoma has a grim prognosis, and currently no standard of care exists to guide management[27]. They emphasised that molecular profile of uveal melanoma is distinct from cutaneous melanoma, and accordingly the treatments differ. In order to define optimal management, patients diagnosed with advanced uveal melanoma should be offered participation in a clinical trial whenever possible.

A systematic review and meta-analysis of papers published on Pubmed from 1 January 1980 to 29 March 2017 looked at 78 studies and pooled data on 2494 patients. They found no clinically significant difference in overall survival by treatment modality or decade[28]. They concluded that most of the difference in reported overall survival likely is attributable to surveillance, selection, and publication bias rather than treatment-related prolongation.

Triozzi and Singh reviewed adjuvant therapy in uveal melanoma and reported that, at present, there is no evidence that any approach improves outcome[29]. They also emphasised that participation in well-designed, scientifically sound clinical trials is essential to develop effective adjuvant therapies.

Most recently, Khoja et al conducted a meta-analysis using individual patient level trial data to determine benchmarks for progression-free survival and overall survival in metastatic uveal melanoma by carrying out univariable and multivariable analysis[14]. Their results showed an median overall survival

of 10.2 months with patients with liver directed treatments showing a statistically significantly longer overall survival of 14.6 months. They concluded that their meta-analysis showed that progression-free survival and overall survival from metastatic uveal melanoma generally remained poor in clinical trials published over the last 13 years.

In summary, despite a number of novel therapies being trialled, there is no evidence that any of the currently available management options improve overall survival by any significant degree.

SURVEILLANCE FOR METASTASES FROM UVEAL MELANOMA

In the absence of proven systemic therapies and limited success with liver directed treatments, there are many multi-centred trials looking at treatment for metastatic disease with the hope of finding a cure or a treatment that prolongs survival. This has led to the introduction of surveillance programmes with the aim of identifying metastases early, allowing for liver directed treatments, clinical trial entry or standard systemic treatment whilst the patient has good performance status and end organ function. The latest clinical trials can be found on various databases online, for example the cancer research UK website (https://www.cancerresearchuk.org/about-cancer/find-a-clinical-trial).

Surveillance protocols

It has been previously shown that surveillance allows early detection of metastases prior to the development of symptoms. Although a survival benefit to surveillance has not been proven, most centres perform periodic screening of all or high-risk uveal melanoma patients, and surveillance is now considered to be good clinical practice. The uveal melanoma guidelines

achieved a consensus for lifelong six-monthly liver screening in all melanoma patients despite the lack of evidence in the literature supporting this practice[8]. Factors supporting surveillance include improved potential to identify oligometastatic disease, which may be amenable to local therapies such as ablation or resection, reduced morbidity from advanced disease, more therapeutic options with standard treatments if patients have good performance status and organ function, and identifying patients eligible for clinical trials[30].

Surveillance protocols varies widely between institutions with no universally accepted protocol based on serological or radiological investigations[31,32]. Liver function tests have been proven irrelevant in the diagnosis of hepatic metastases from uveal melanoma[33]. A wide variation exists concerning the choice of the imaging examination and the frequency of the surveillance[34].

In Europe, ultrasound of the liver is typically performed every 6 months for 10 years, with CT or MRI being performed if a suspicious lesion is identified[35]. At some tertiary-care centres in the USA, surveillance is usually carried out in a twofold manner, using contrast enhanced MRI for the liver and CT chest, abdomen and pelvis for whole-body surveillance, with the timing based on the risk of metastasis indicated by the tumour histology and genetic profile[36]. It should be borne in mind that financial incentives, fear of malpractice and patient pressure/ request are well recognised factors resulting in excessive investigations and over treatment in the USA.[37]

Similarly, the duration of the surveillance in various centres is also non-uniform. The Uveal Melanoma guidelines suggested life-long surveillance[8] but, in practice, very few institutions perform regular scanning for life. For example, the WCC in Memphis has a protocol of performing surveillance 6-monthly for 2 years and then annually up to 5 years[38]. They have no set

protocol for the 5 to 10 year period but generally surveillance stops 10 years after diagnosis. Marshall and colleagues instituted a semiannual MRI screening program that targeted high-risk patients, defined as predicted risk of metastatic death at five years greater than 50%, and detected asymptomatic disease in 83/90 (92%) of patients[39]. Stratifying surveillance strategies by risk may make better use of resources and be both time and cost effective. However, the benefit of prolonged and more frequent surveillance must be weighed against the risks associated with extended imaging.[39]

There are a number of cancers that have surveillance protocols for metastases (e.g. lung, prostate, etc) . Generally the surveillance protocols are conducted for 5-10 years. The aim is to detect locoregional recurrence or metastatic disease at an early stage with the assumption that an early salvage treatment can lead to better survival. However, intensified follow-up programmes are controversial. For example, a large metanalysis showed that there is no overall survival benefit for intensifying the follow-up of patients after curative surgery for colorectal cancer[40]. The majority of screening strategies for recurrent colorectal cancer do not extend beyond 5 years[41]. Recently, a randomised study showed that SABR (Stereotactic Ablative Radiotherapy) in oligo-metastatic patients improves overall survival compared to standard of care palliative treatments[42]. However, in metastatic uveal melanoma there is no evidence that an early detection improves survival.

Very few metastases are detected after 10 years of the diagnosis of uveal melanoma and it is incredibly rare for metastatic lesions to be picked up after 15 years post-diagnosis. Clinical monitoring with radiologic imaging for tumour recurrence beyond 10 years post therapy of the primary tumour is not cost-effective because of the rarity of delayed recurrence[43].

Mode of surveillance

There is a wide variation in the non-ionising modality used to image the liver for surveillance in these patients. In the UK, it is recognised that some centres employ MRI with or without contrast in 'high-risk' uveal melanoma while others perform the initial hepatic assessment using ultrasound and only progress to other modalities when ultrasound detected abnormalities are seen[8].

Belerive et al reviewed the imaging characteristics of incidental common benign liver lesions and contrasted them with uveal melanoma metastases. Their paper lays out the advantages and disadvantages of the differing liver imaging modalities in a tabular form[44]. In summary, liver ultrasound is low-cost, widely available, non-invasive and has no side-effects but may not be able to scan the whole liver due to body habitus and is operator dependent. The MRI with contrast is the most specific modality for picking up small liver metastases and is at least as sensitive as CT[36]. However, it is expensive, time-consuming and not suitable in all patients (e.g. with metallic implants, pace-maker, claustrophobia, etc) and has a high false positive rate. This contributes further to heightened patient anxiety[45]. There is also evidence that repeated MRI scanning with contrast results in accumulation of the contrast medium in the brain[46].

Chaudhary et al conducted a retrospective cohort study of their patients looking at 1390 hepatic ultrasound scans[47]. They used a stepwise surveillance protocol based on serial hepatic ultrasounds followed by confirmatory scans. They found that the sensitivity, specificity, and positive predictive value of hepatic USG for findings that were indeterminate or suspicious for metastasis were 96%, 88% and 45% respectively. The specificity of the confirmatory scan was greater than that of hepatic USG (93% vs 88%, respectively). They concluded that this approach offers a high

likelihood of detecting asymptomatic metastases in patients with primary uveal melanoma.

It is generally accepted that MRI is more sensitive than ultrasound in detecting liver metastases; however, there is no evidence to suggest that routine surveillance with MRI scanning (as opposed to ultrasound scanning) confers a survival advantage to uveal melanoma. There have been no comparative studies or controlled trials between these modalities in this respect.

Risk stratification

The risk of metastasis in uveal melanoma is determined by multiple factors, including clinicopathological features such as tumour size and location[6] and molecular genetic abnormalities, most notably the loss of chromosome 3[48,49]. Therefore, some tumours are at higher risk for metastasizing than others[50,51]. For patients with high-risk tumours, oncologists often recommend either more frequent and/or more intensive surveillance such as inclusion of hepatic CT/MRI in addition to hepatic ultrasonography[47,52].

Targeted surveillance, in the highest risk patients with the greatest needs, also offers a practical setting where clinical trials may be most helpful in elucidating the role of follow-up[8]. However, the level of risk that is employed as a cut-off is clearly subject to debate. The risk-versus-benefit ratio of screening in 'low metastatic risk' disease poses additional challenges and must be carefully weighed against potential harm from false positive findings, potential radiation exposure, psychological morbidity and the economic impact.

The definition of 'high risk' uveal melanoma is made by either using the AJCC TNM staging (8th Edition) or from cytogenetic testing on biopsy

material or from enucleated eyes. Although routinely offered, very few patients in the SOOS seem to be keen on a biopsy for prognostication (unpublished data). In this setting, defining a high-risk melanoma can only depend on non-pathological and non-cytogenetic factors except in cases where an enucleation or biopsy has been performed. The Uveal Melanoma Guidelines group suggested that a high-risk melanoma may entail inclusion of various factors including large tumour size, ciliary body involvement and an AJCC stage which prognosticates a more than 30% chance of death in 5 years[8]. The AJCC staging (8th Edition) is detailed in Appendix 1 and the survival rates are given in Appendix 2.

A high-risk melanoma may therefore include the following-

1. AJCC (8th Edition) Stage IIIA or worse[8]
2. Patients with high-risk pathological features including epitheloid cells, extra-scleral extension and the presence of closed connective tissue loops[8].
3. Presence of Monosomy 3[36,50]
4. Presence of abnormalities in Chromosome 8 (8p loss, 8q gain)[36,50]
5. Presence of BAP-1 mutations[50,53]

Therefore, an effective strategy would be to target the high-risk uveal melanoma patients with the more sensitive imaging modalities for surveillance of liver metastases. The high-risk melanomas are defined by this consensus group in Appendix 3. The consensus group has suggested a surveillance protocol for Scotland in Appendix 4.

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APPENDIX 1

STAGING SYSTEM FOR POSTERIOR UVEAL MELANOMAS USED AT THE SCOTTISH OCULAR ONCOLOGY SERVICE- ADAPTED FROM AJCC 8TH ED

STEP 1:

Obtain a tumour (T) category using largest basal diameter (mm) and tumour thickness (mm)

T Category	T Criteria
1 A	T size 1 without ciliary body involvement or extraocular extension
1 B	T size 1 with ciliary body involvement
1 C	T size 1 with extraocular extension ≤5mm in largest diameter
1 D	T size 1 with ciliary body involvement and extraocular extension ≤5mm in largest diameter
2 A	T size 2 without ciliary body involvement or extraocular extension
2 B	T size 2 with ciliary body involvement
2 C	T size 2 with extraocular extension ≤5mm in largest diameter
2 D	T size 2 with ciliary body involvement and extraocular extension ≤5mm in largest diameter
3 A	T size 3 without ciliary body involvement or extraocular extension
3 B	T size 3 with ciliary body involvement
3 C	T size 3 with extraocular extension ≤5mm in largest diameter
3 D	T size 3 with ciliary body involvement and extraocular extension ≤5mm in largest diameter
4 A	T size 4 without ciliary body involvement or extraocular extension
4 B	T size 4 with ciliary body involvement
4 C	T size 4 with extraocular extension ≤5mm in largest diameter
4 D	T size 4 with ciliary body involvement and extraocular extension ≤5mm in largest diameter
4 E	Any T size with extraocular extension ≥5mm in largest diameter

STEP 2:

Obtain a T score using information on ciliary body involvement and extraocular extension

N Category	N Criteria
N0	No metastasis
N1a	Metastasis in one or more regional lymph node
N1b	Discrete tumour deposits in the orbit not contiguous to the eye

STEP 3: Obtain an N score

M Category	M Criteria
M0	No distant metastasis
M1a	Largest diameter of largest metastasis ≤3.0 cm
M1b	Largest diameter of largest metastasis 3.1 – 8.0 cm
M1c	Largest diameter of largest metastasis ≥8.1 cm

STEP 4: Obtain an M score

T	N	M	Stage
1a	N0	M0	I
1b-d	N0	M0	IIA
2a	N0	M0	IIA
2b	N0	M0	IIB
3a	N0	M0	IIB
2c-d	N0	M0	IIIA
3b-c	N0	M0	IIIA
4a	N0	M0	IIIA
3d	N0	M0	IIIB
4b-c	N0	M0	IIIB
4d-e	N0	M0	IIIC
Any T	N1	M0	IV
Any T	Any N	M1a-c	IV

APPENDIX 2

PROGNOSTICATION FOR POSTERIOR UVEAL MELANOMAS BASED ON AJCC STAGING

Stage	5 Year Survival (%)[1]	10 Year Survival (%)[1]	5 Year Survival (%)[2]	10 Year Survival (%)[2]
I	96	88	97	94
IIA	89	80	89	84
IIB	81	67	79	70
IIIA	66	45	67	60
IIIB	45	27	50	50
IIIC	26	N/A	25	N/A

[1]Original study
Kujala E, Damato B, Coupland SE et al
Staging of ciliary body and choroidal melanomas based on anatomic extent.
J Clin Oncol 2013; 31:2825-2831

[2] Validation study
AJCC Ophthalmic Oncology Task Force. International validation of the American Joint Committee on Cancer's 7th Edition classification of uveal melanoma. JAMA Ophthalmology 2015; 133:376-383

APPENDIX 3

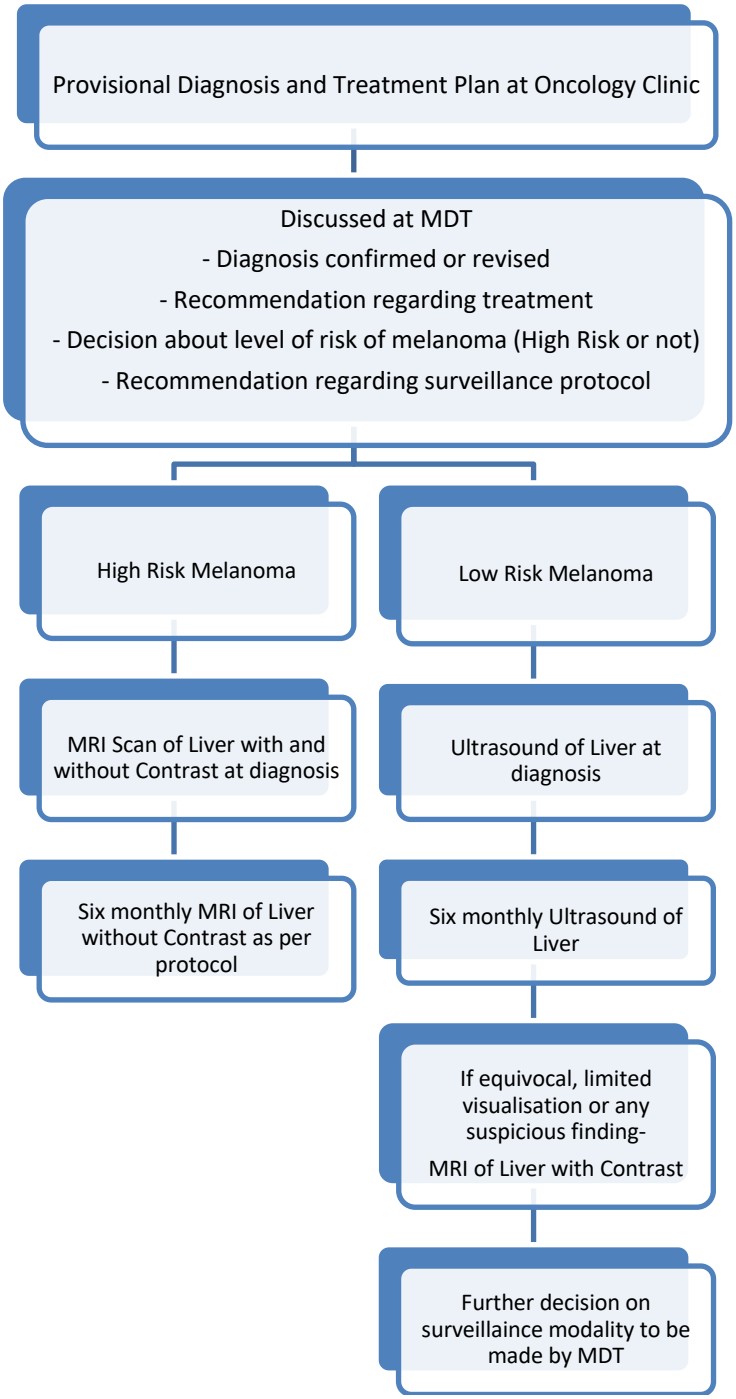
CONSENSUS ON DEFINITION OF HIGH RISK UVEAL MELANOMAS

1. Choroidal and Ciliary Body melanomas which are Stage IIIA or worse as per the AJCC (8th Edition) staging
2. Cytogenetic testing confirms Monosomy 3
3. Cytogenetic testing confirms abnormalities in Chromosome 8 (8p loss, 8q gain)
4. Cytogenetic testing confirms BAP-1 mutations
5. In the absence of cytogenetics testing, pathological features indicating high-risk include extra-scleral extension, epitheloid cells and closed vascular loops – decision to be made at the multi-disciplinary meeting (MDT)
6. Any other features of the tumour or other factors that may indicate a high risk of metastases– decision to be made at the MDT

All Melanomas that are not classified as 'High Risk' will fall into the 'Low Risk Group' for surveillance purposes.

APPENDIX 4

PATHWAY FOR SURVEILLANCE OF LIVER METASTASES IN UVEAL MELANOMA IN SCOTLAND



* If MRI is contraindicated, triple phase CT scan of liver may be used

APPENDIX 5

PARTCIPANTS OF OCULAR ONCOLOGY MDT (MULTI-DISCIPLINARY MEETING) AT GLASGOW

1. Ocular Oncologists (ophthalmologist with expertise in ocular oncology)
   - Dr Paul Cauchi
   - Dr Vikas Chadha
   - Dr Julie Connolly

2. Clinical Oncologists
   - Dr Stefano Schipani
   - Dr Diana Ritchie

3. Radiologists
   - Dr Wilma Kincaid
   - Dr Oliver Cram

4. Pathologists
   - Dr Fiona Roberts
   - Dr Chee Thum

5. Ocular Oncology Nurses
   - Ms Agnes MacLean
   - Ms Julie Mathieson
   - Ms Gayle Purdie
   - Ms Nichola Campbell

6. Liaison Oncology Nurses from Beatson Institute of Cancer
   - Ms Cathy Johnstone
   - Ms Julie Tyczynski

7. Ocular Oncology Fellow and Registrars

8. Input from Medical oncologist, Interventional radiologists and Hepatic Surgeons as and when required

APPENDIX 6

LOGISTICS OF SURVEILLANCE FOR METASTASES FROM UVEAL MELANOMA IN SCOTLAND

1. The surveillance protocol will be individualised for each patient and decided by the Scottish Ocular Oncology Service (SOOS) MDT in conjunction with the patient.

2. This will be communicated to the referrer, the patient's GP and the radiology department of the NHS Trust Hospital closest to the patient.

3. The surveillance (ultrasound/ MRI/ CT scan) shall be carried out by the patient's NHS Trust, usually in the hospital closest to the patient's residence.

4. The requests for the liver ultrasounds will come directly from the Scottish Ocular Oncology Service in the form of a copy of the clinic letter being sent to the patient's local radiology department.

5. The requests for the liver MRI (or CT) will also come directly from the Scottish Ocular Oncology Service in the form of a copy of the clinic letter accompanied by an NHS Radiology request form with the completed checklist, both of which will be sent to the patient's local radiology department.

6. If the patient has been discharged from SOOS to the care of another ophthalmologist, that clinician will then be responsible for ensuring the requests for surveillance.

7. It is preferred that the above requests, where possible, be sent by secure email by SOOS, in the interest of speed and traceability. However, if no such provision is available in the radiology department, it will be done by hard copies sent through regular mail.

8. A three-fold strategy is used to follow-up on the results of the scans requested-
   a. The patient is given a phone number and an email and requested to let us know by either method once they have their surveillance scan.
   b. The Oncology Coordinator keeps a record of the requests sent out and checks the PACS system for the reports on a regular basis
   c. The Trusts send us the scan report by hard copy

We intend to audit this process to ensure that it is fit for purpose. At present, the SOOS which is based in NHSGGC has no electronic way of keeping track of radiology appointments outside of GGC.

9. SCIN (Scottish Clinical Imaging Network) has confirmed that all ultrasonographers across Scotland are trained to do liver ultrasounds and identify any abnormality detected (minutes from SCIN meeting at Larbert, 23 August 2019). Any concerns regarding this should be highlighted to the responsible clinicians immediately so that appropriate training can be organised.

10. Protocol for Liver Ultrasound at SOOS
    At the SOOS (Scottish Ocular Oncology Service), the radiology department at NHSGGC performs liver ultrasounds focussing only on the liver to look for any suspicious lesions (with no attention being given to other abdominal structures). This allows all of the time available to be devoted to scanning the liver and reduces the total time of the abdominal scan.

11. Protocol for Liver MRI at SOOS
    At the SOOS (Scottish Ocular Oncology Service), the radiology department at NHSGGC performs an MRI Liver as per the following protocol:
    Initial scan - Coronal HASTE, Coronal TRUFI, Axial T2 Dual echo, Axial T2 fat suppression, Axial T1 in and out of phase, Axial DWI, Dynamic contrast enhanced sequences with Primovist contrast (hepatocyte specific contrast). The total scanning time is 40 minutes.
    Follow up scan (assuming 1st scan clear) - Coronal T2 HASTE, Axial T2 fat suppression, Axial T1 in and out of phase, Axial DWI.