Exploring the quality-of-life impact of driving license surrender in patients undergoing stereotactic radiosurgery/radiotherapy (SRS/SRT) for brain metastases at a single centre.

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Exploring the Quality-of-Life Impact of Driving License Surrender in Patients Undergoing Stereotactic Radiosurgery/Radiotherapy (SRS/SRT) for Brain Metastases at a Single Centre.

Keywords

Stereotactic Radiosurgery (SRS), quality of life (QoL), driving cessation (DC), mobility, independence,

Introduction

Driving is widely associated with maturity, independence and social participation that influences Quality of Life (QoL).[1,2,3]

In the United Kingdom (UK), approximately 60.5% of the population holds a driving licence, which highlights its role in everyday life.[4] For individuals diagnosed with brain metastasis (BM), the ability to drive may be significantly affected. Research suggests that up to 90% of patients have evidence of neuropsychological deterioration at diagnosis, with between 10 and 20% experiencing seizures as a presenting feature.[5] Data that there is an elevated seizure risk in some patients, particularly those with melanoma, following stereotactic radiosurgery (SRS) and immunotherapy. [6]

In the UK, license holders are legally required to self-report any medical conditions that affect the ability to drive for three months or more to the Driver and Vehicle Licensing Agency (DVLA).[7]

The requirement to deliver SRS treatment within two weeks of the in-clinic decision to treat poses specific challenges for the referring team in communicating the brain metastasis diagnosis to patients and advising them to notify the DVLA. A recent local audit at the study centre, conducted to assess patients' knowledge of DVLA requirements, found that approximately one quarter of patients had not been informed of their legal obligation to notify the DVLA during the consent or consultation process, indicating inconsistent practice.

This has resulted in distress to patients, with patients expressing that the inability to drive would impact their quality of life significantly more than the diagnosis itself due to perceived lifestyle limitations. This was mainly due to patients being heavily dependent on a car due to their rural residence. Advice given to patients was seen as poor and reflects the lack of research and guidelines available to clinicians, resulting in broad, inconsistent advice. [5,8,9,10]

Given the absence of research that examines driving cessation (DC) within a radiotherapy context, particularly among patients treated with SRS for BM, the aim of this study was to investigate the impact DC has on patients who have been treated with SRS at a single centre in the UK and what further support may be required.

In support of the project, a literature review was conducted in 2022 (yielding 29 papers) and updated in 2024 with an additional 7 papers, utilising search engines such as Google Scholar, University library, Springer, and SAGE. Key phrases were used to cover as many articles as possible: “Surrendering driving licence”, “Quality of life”, “Consequences of driving reduction”, “Driving and patients with brain tumours, “Impact of driving cessation “and “Driving and brain metastasis”. This identified that most research has focused on elderly care, and the author wanted to explore the impact of DC on cancer patients, specifically those undergoing SRS.

Evidence from studies of those who have studied the loss of independence and social identity in older patients and those with dementia has shown that driving cessation frequently affects an individual's sense of autonomy and life satisfaction, as driving is closely tied to personal freedom, social interactions, and self-reliance. [2,3,11,12,13,14]

Research from studies in older adult drivers has shown that DC negatively impacts mobility and is a multidimensional construct involving many variables, including personal expectations and preferences, independence, freedom, life satisfaction, self-reliance, and social interactions.[3,11,12,13,14] The scale of impact of this is exacerbated due to a higher expectation of maintaining driving licences into older life and is influenced by the level of QoL and dependence on others for their transportation needs.[14,15]

Several studies in older adults have highlighted that non-drivers reported lower levels of independence, while drivers remained more connected with friends and more likely

to seek medical care. [11,12,13,14,16,17] Relying on others for lifts can alleviate the impact of DC; however, this can lead to a feeling of being a burden,[13,20] and does not provide opportunities for spontaneity to do things when desired.[13,15,18,19,20] Despite this, some research suggests that, for some people, accepting that they are no longer able to drive and viewing it as a new positive stage of life can reduce its impact.[18]

Psychological health can be defined by independence, personal identity, depression, and life satisfaction. The negative psychological aspect of DC is seen to impact all these aspects of psychological health in studies on how DC affects people in later life, regardless of whether medical factors, psychosocial and demographics are accounted for, resulting in less active drivers having higher mean averages of depression.[2,14,15,21,23,24]

More recent research in barriers to social participation after DC has examined the need to change public policy to mitigate the impact on QoL for non-drivers by improving public transport and pavement quality.[11,12] Evidence suggests that education programmes on legislation and on alternative transport and resources to maintain social activities could help,[17,19,25] but this needs to be considered alongside programmes that prolong mobility and early mobility counselling.[2,23]

Research Questions and Aims:

Aims

To determine how patients surrendering their driving licence following SRS treatment for brain metastases are impacted by how the news is delivered. To determine whether there is a demand for an information leaflet about surrendering a driving licence, and if this is the case, to help identify what should be included in the leaflet.

Research Question

What is the QoL impact of surrendering a driving licence for patients with brain metastasis treated with SRS/SRT?

Is there a role for an information leaflet in reducing the impact of driving cessation on QoL?

Methods

Questionnaire Development

An anonymous, quantitative, closed-question postal questionnaire was used, with some open-ended boxes to capture individual comments. An ordinal Likert scale of 1-5 (1 = strongly disagree, 5 = strongly agree) provided measurable outcomes.[26]

The questions and structure were adapted from a mobility-related QoL measurement scale by Yeoh et al.[14]. Questions from this survey were rephrased to support measurement of the impact of DC due to their diagnosis of BM, as opposed to what driving allows people to do. Questions were tested by a small focus group (n=8; n=2 male and n=5 female, age range 36-74) selected by the author, who had received their SRS treatments more than a year previously. The focus group were asked to sign a consent form agreeing to participate, which was destroyed upon receipt of their feedback. The group found the questionnaire manageable to complete. The questions aligned with NICE guidelines for Care Needs of People with Brain Tumours,[27,] and patients were supported throughout the experience and provided with contact details for hospital and university support services on the patient participation sheet. The questionnaire and study design were sent to the Trust's ethics group and the university for approval and were approved.. Once the questionnaire was sent to participants, the database containing the patients' names and contact details was destroyed.

Settings and participants

Patients who had received SRS between August 2017 and December 2021 were selected, making a total of 153 patients. This was reduced to 132 once the exclusion criteria were applied.

Inclusion criteria	**Exclusion criteria**
Patients with a known Karnofsky Performance scale of 60 or more. (Able to live at home and care for most of their personal needs, with some assistance). Many of these patients would have been	Non-drivers and patients with less than P/S 60 on their medical records (unable to care for self, requires equivalent of institutional or hospital care, disease may be progressing rapidly) within 3 months prior to sending out the

fit to drive at the time of the questionnaire if they had been allowed to drive.	questionnaire. These patients were not fit to drive at the time of the questionnaire due to their poor health and would not be eligible to participate in a study.
	Deceased Patients

Table 1: Inclusion and Exclusion criteria.

Data analysis

SPSS version 27 was used to summarise the data by calculating the mean and mode for each question. Questions were grouped into themes identified in the literature review. Percentages were used to describe the number of responses using a Likert scale, and modes were used to determine the most frequent responses in each theme. Open-ended survey responses were analysed using qualitative content analysis (Krippendorff, 2018). Responses were systematically coded to identify recurring concepts, which were grouped into themes, with theme frequencies recorded and supported by representative anonymous quotations..[28]

Results:

A total of 132 questionnaires were posted; 49 were returned, but one was discarded as incomplete; therefore, 48 were analysed, representing a 36% response rate. Nineteen patients were male, and twenty-nine were female, with ages ranging from 25 to 84. The mode age range was 55-64.

Section A: Driving

Four participants reported driving on a short-term medical license. The average duration of DC was 26.5 months; two participants were unable to drive for 10 years, three for 4 years and two for 3 years. The range for DC spanned from 3 months to 10 years.

On average, patients travelled 33 miles to reach the hospital, with distances ranging from 3 to 250 miles. While 52% of patients relied on a car due to their location, 71% had access to a secondary driver.

Section B: Impact of QoL on Driving

Statistical analysis questions were collated using a Likert scale and grouped as: mobility, independence, social interactions, mood change and overall quality of life.

A) Mobility and activity

Participants were asked to what extent they were less mobile and less active because of DC. The mode strongly agreed that participants were less mobile and less active because of DC with 90%, when combining strongly agree and agree reporting that they were less mobile and 56% of participants reporting they were less active.

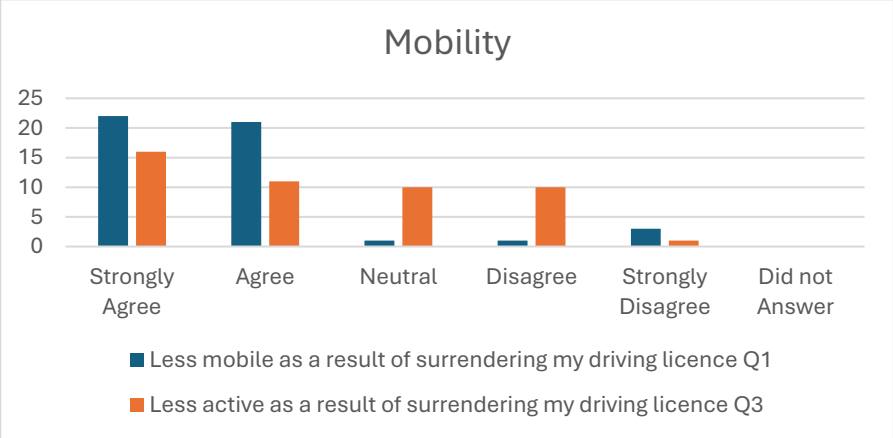

Figure 1: Mobility and Activity

Patients were able to articulate and expand how DC impacted on their mobility in the free text boxes:

"I hate being reliant on other people to take me everywhere"

"It is very difficult to organise my life now due to a lack of mobility"

"Losing ability to drive means losing my favourite activity and my safe space. It makes me feel like a burden and makes me less inclined to venture out and therefore less active, which is very unfortunate"

B) Independence

Participants were asked to what extent they were less independent, more restrictive and more reliant on others because of DC. The mode strongly agreed that independence was affected by the loss of DC. When combining strongly agree and agree responses, 94% of participants reported being less independent, whilst 96%

reported being more restricted in their activities and 80% more reliant on others for shopping. 48% were more reliant on others for banking and 76% of participants were reliant on others to get them to their health appointments.

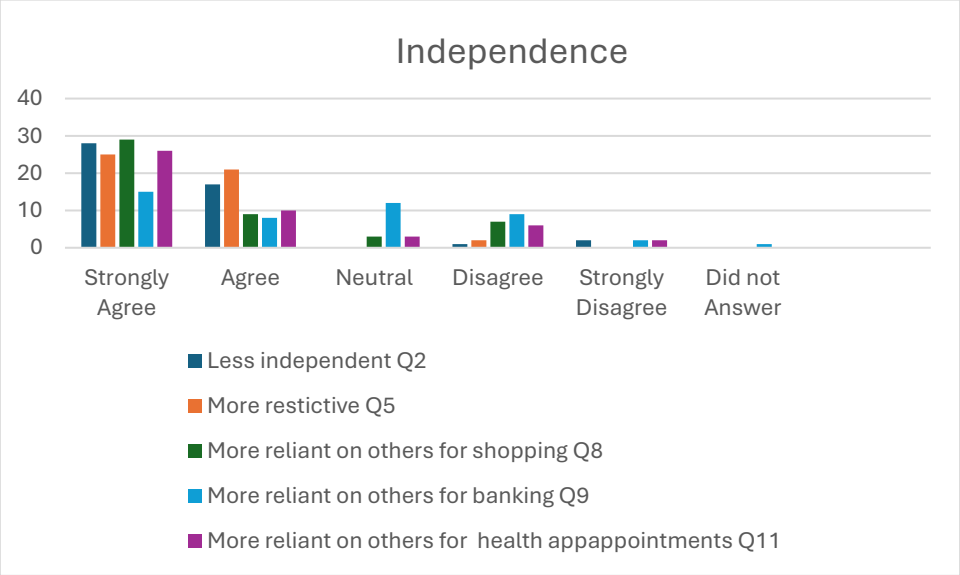

Figure 2: Independence

The free text boxes show the emotional impact:

"Complete lack of independence. Having to rely on others to drive me everywhere"

"Stripped my independence"

"I doubt I will ever drive or have independence/spontaneity"

"I enjoyed the spontaneity of being able to drive see friends and enjoying the nature of life around me"

C) Social Interactions

Participants were asked to what extent their social interactions were reduced because of DC. The mode strongly agreed that it was harder to keep up with social interactions. When combining strongly agree and agree, 60% of participants found it harder to keep in touch with family, 76% with friends and 80% we less able to help others or do volunteer activities.

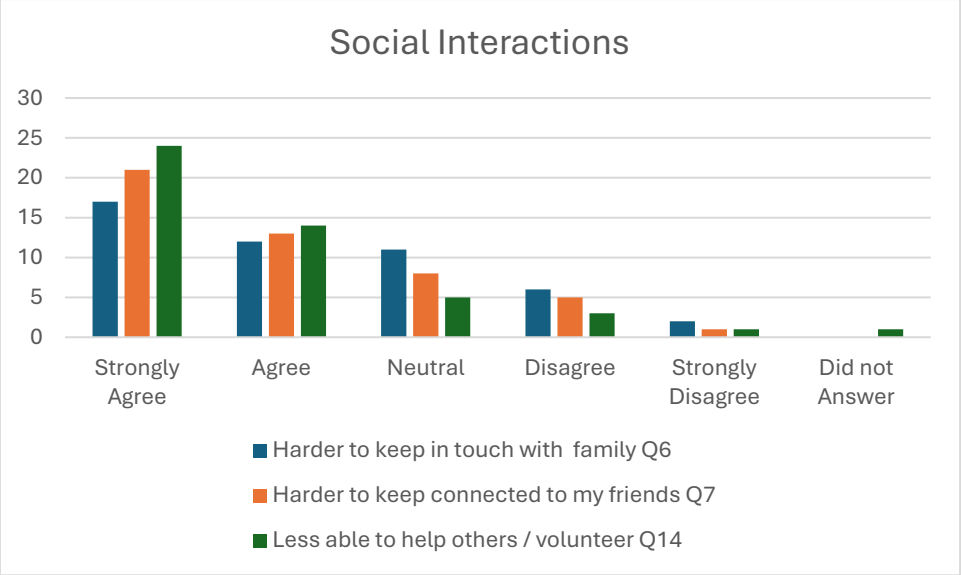

Figure 3: Social Interactions

The free text further supported the data:

"I cannot visit family, friends, go shopping or take my children out"

"It's harder to see friends living remote"

"Not being able to drive has stopped much of my social life, and impacted my ability to do things like care for my parents and sick husband"

There was a clear link to the research from other groups about the importance of maintaining social networks [2,3,11,13,15,21]:

D) Mood Change

Participants were asked to what extent their mood was affected because of DC. Although there was a mixed response , there was clear evidence that DC made it harder for participants to do things that they enjoyed, with a mode of 5. When combining strongly agree and agree, 81% of participants found it harder to do things they enjoyed, 48% participants had less confidence, 46% found DC affected their self-esteem, whilst 48% of participants noted that they were more irritable and 57% reported getting more depressed.

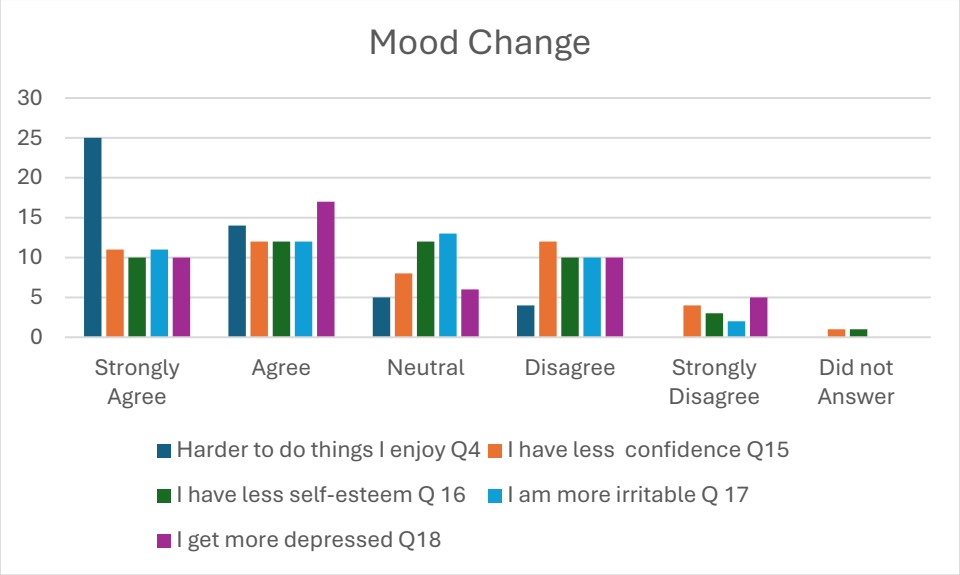

Figure 4: Mood Change

The comments provide a greater understanding of how DC impacts mood.

"This has an effect on our well-being and independence"

"It has caused a lot of depression not being able to do things because of travelling restrictions not being able to drive"

"Hardly an hour goes by without an emotional response of some sort!"

"I feel very isolated and vulnerable now. I rarely go out of the house except for hospital appointments"

E) Overall Quality of Life

Participants were asked whether there was an overall reduction in QoL due to DC. The mode strongly agreed that QoL was reduced because of DC, and when combining strongly agree and agree, 79% reported a reduction in their quality of life.

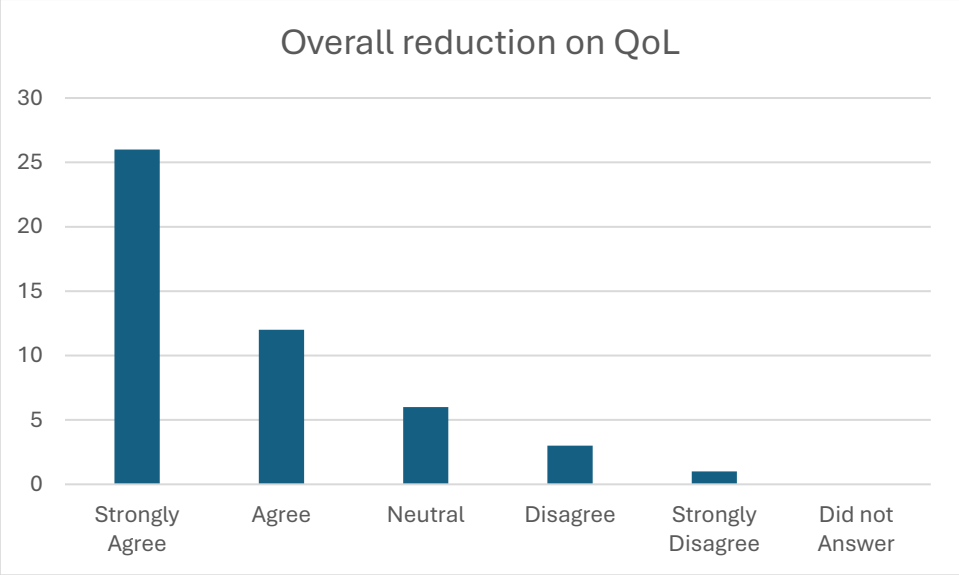

Figure 5: Overall reduction in QoL.

Section C: Provision of patient information.

One of the study's aims was to determine whether further written information was required. Participants were asked to what extent they agreed with a series of statements relating to what further information was required. When combining strongly agree and agree, 65% of participants wanted more information about how to inform the DVLA and about being told they could not drive. 83% wanted information about how to get their licence back. Questions about information around some practical help showed that 65% would like information on financial support towards the extra travel costs, 50% would like some information about other means of transport, and 25% of participants would like information on how to get to the hospital.

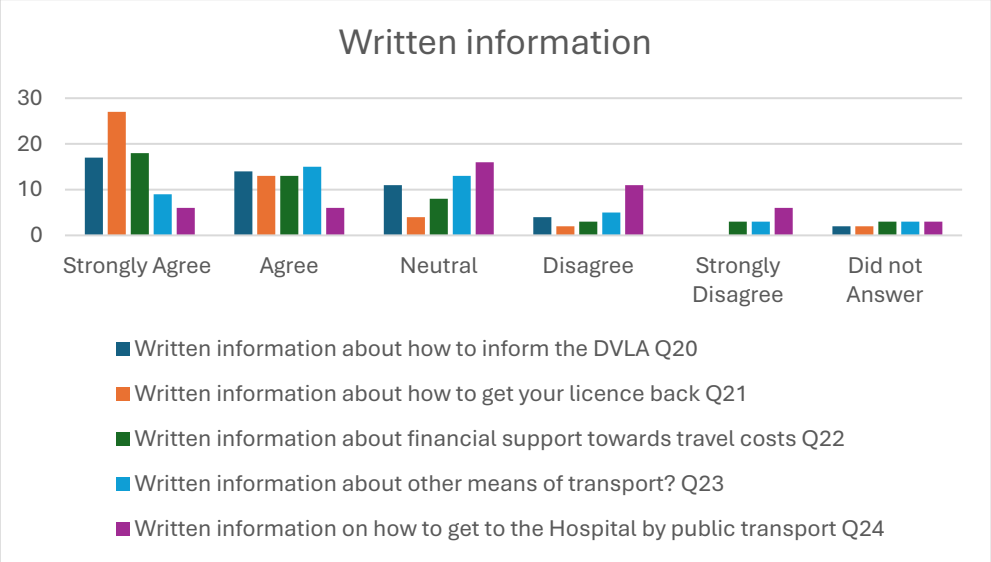

Figure 6: Written Information

In the free-text boxes, some patients reported feeling information overload on the day they came for consent, making it all too much to take in. Two patients articulated this as follows:

> *"Receiving any information "verbally" is not particularly helpful after undergoing brain treatment. It should be expressed to a patient's helper/carer or, better still, be written info! I was informed verbally after my brain treatment (not in the presence of my primary carer), and I instantly forgot what the doctor told me!"*

> "*After receiving my diagnosis my wife and I went up to radiology, and it seemed very matter of fact in the way the information was delivered. I believe I just nodded my agreement to surrender my licence. It did not sink in until later, like a lot of things that November a classic example of denial I suppose."*

Section D: Use of other information resources

The data showed that not all patients used websites for further information; only 63% of participants reported reviewing them. A variety of websites were used, as shown in Figure 7

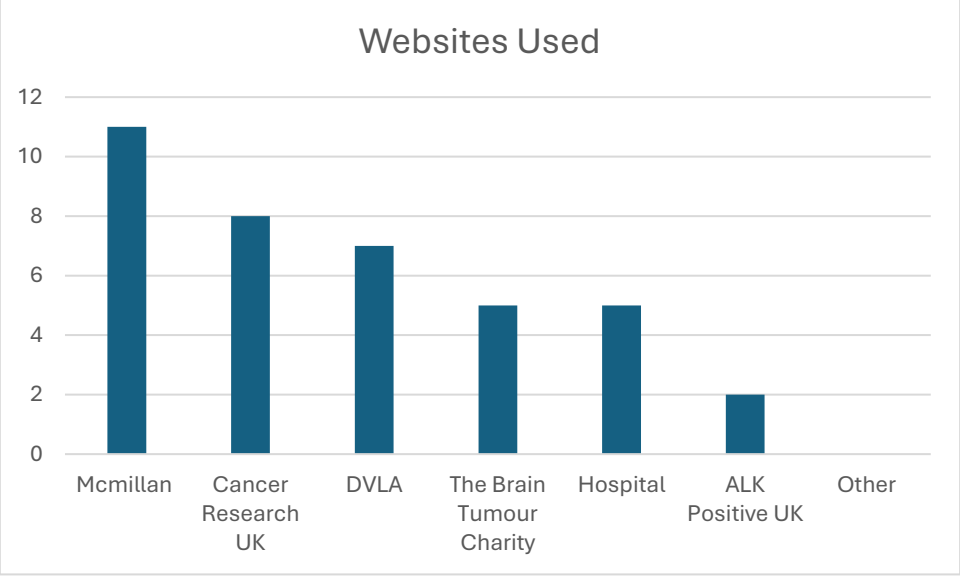

Figure 7: Variety of websites used for further information

An area not specifically covered in the questionnaire but addressed through open-ended questions was participants' issues with the DVLA and the frustrations these caused, including delays in obtaining information and delays in response times. In this small single-centred study, eleven patients reported issues with the DVLA. The main themes were difficulties contacting the DVLA and the time it took to receive a response, both during the initial application process and when reapplying for a medical licence. Several participants reported that the letter they received from the DVLA was insensitive and that the questionnaire. was ambiguous.

"The medical questionnaire from the DVLA is very ambiguous, and at least one question does not make sense at all"

"The insensitivity of the DVLA letter, as if a crime had been committed, appalling, brutal"

"Impossible to get through to the DVLA on the telephone during 2001. Not possible to email them. I applied to renew my one-year medical licence on 24.05.2021, but have been unable to get through to DVLA and have received no acknowledgement of application other than proof of delivery from Royal Mail. Currently driving on section 88 until July 2022"

Discussion:

BM are a common presentation of cancer, with between 10-20% patients developing these. The aim for all treatment options for BM is to extend survival and improve QoL.[36] The shift to SRS treatment is noticeable in recent years, with the opinion that SRS provides a better QoL than whole brain radiotherapy.[32]

To the best of the authors' knowledge, this is the first paper to explore QoL in SRS patients. The study outcomes align with studies in older adults and dementia studies in that there is a QoL impact from DC in all five themes: mobility, independence, social interactions, mood change and overall quality of life, highlighting that there is scope for further research in this group of patients to determine how these patients can be further supported through the process of DC.

The impact of DC for those receiving SRS is becoming more relevant due to improved survival following SRS. These outcomes have been observed anecdotally at the authors' centre and from questionnaire feedback, with an average time of 26.5 months without driving. Improved survival is also beginning to appear in the published literature, which reports that many patients are now living for years after diagnosis. [38] Some patients consider the driving ban unfair, and the ALK (Anaplastic Lymphoma Kinase) Positive UK charity is actively campaigning to reduce the length of the ban.

*"We have been in discussions with the DVLA for some time now, trying to effect change to their current guidance. We had a small success last year as they reduced the time to review to 1 year from 2 years; however, we are seeking further lifting of restrictions" (*D. Montague, personal communication May 03,2022).

Participants were seen as legally fit to drive prior to diagnosis of BM, and for some, this restriction came as a shock and was seen as a detriment to their QoL. This is where the study differed from other studies outside radiotherapy, in which participants had experienced a gradual decline in their health and, for some, an acceptance that the loss of driving is a part of ageing. [2,11,12,21,22,30] Evidence from studies shows that the impact of DC is multifactorial,[11] indicating that this is a complex subject and there is scope for further investigation.

In this study, 90% of participants reported reduced mobility, and prior research has shown that this affects overall health by limiting activities outside the home and contributing to social isolation.[3,11]

Therefore, maintaining mobility is considered crucial, and there could be scope to investigate whether the blanket driving ban for BM patients is necessary and needs to be tailored more to the individual patient, as evidence suggests that the risk of injury whilst driving for some patients is minimal due to the location of the tumour, better treatments and regular surveillance.[6]

Independence is something most people treasure from a young age, and 94% of participants reported feeling less independent after losing their licence. Evidence from studies in older people indicates that maintaining independence is closely linked to mobility and is often seen as a major loss.[2,25] Driving clearly facilitates independence, and for those used to the freedom that driving allows, surrendering this privilege

produces feelings of annoyance and resentment at the need to rely on others for transport. This impact can also affect other themes, such as social mixing and commuting.[1]

This study concurred with research in social isolation and DC in that DC has an impact on staying in contact with other people, with over 60% of participants reporting that it was harder to stay in contact with family, and 71% with friends. There is a clear link between Qol, social isolation and general health in the elderly, which can lead to premature death and poorer physical and mental health.[30] This study identifies that the majority of participants did experience a reduction in social interactions, and further studies to understand this further may also identify innovative interventions, such as the use of social media, to mitigate the impact.

Assessing the impact of mood change for patients with BMs is a complex subject, and it is identified in cancer research that depression affects up to 20% of patients and anxiety in 10% patients regardless of what stage they are at in their cancer journey.[31] In some cases, patients present at the clinic without a previous history of cancer or brain disease and have to assimilate the diagnostic information at the same time as being informed that they have to cease driving and report this to the DVLA. Studies have identified that the negative aspects of DC can lead to depression. [24] In this study, 56% of participants reported getting depressed because of DC. It is often hard to analyse the true impact DC has on depression due to the other competing factors that can affect mood, such as managing health conditions. However, studies have shown that there are higher depressive symptoms in those who have ceased driving,15,23,24 and in this study, some participants articulated the impact DC had on things that can affect mood, such as reduced self-esteem and less confidence.

To help reduce the impact of DC, the referring doctor could have a role in preparing patients for the requirement to cease driving before the SRS consultation, given the SRS short pathway and the interval between the diagnostic MRI scan and the SRS consultation. Clinicians may need to consider working more closely with oncologists to explore alternative ways to communicate this news to patients.

DC. Based on the evidence in this study, targeted written information to support patients through the DC process could mitigate some of its negative consequences.

As a result of these findings, the patient information leaflets have been updated to include details on the need to inform the DVLA and the DVLA's contact details.

In health care, it is recognised that recording patients' Health Related QoL can help evaluate the benefits of treatments.[35] Evidence has identified the importance of recording QoL for BM patients. [36] At the authors' centre, QoL status is recorded both pre- and post-SRS using the EQ-5D-3L questionnaire.[35] This is a self-assessment covering five aspects of QoL: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. This study may indicate further scope for exploring the impact of DC over a longer period, which could help clarify its effects on patients and identify support for this group. Findings from other research suggest that, for those for whom a driving ban is appropriate, interventions that reduce social isolation may be beneficial, as earlier support can reduce the impact of QoL on DC. [1,2,24,30] The Brain Tumour Charity website offers useful advice to those who are unable to drive as a result of a brain tumour.[39]

Limitations

This study was undertaken at a single centre with a small number of participants, and a larger study across more sites with more participants would have provided more depth and insight into DC in this cohort. Within the study, there is a self-selection bias as only motivated patients would have responded. This study restricted the study to fitter patients, so there was an under-representation from sicker patients. Within this study, the time patients experienced DC was of differing lengths of time, which could have put some recall bias into the findings. Using a quantitative survey with short free-text boxes limited depth, understanding and reasoning behind the answers. Wording in questionnaires can be interpreted differently by people and may be influenced by other factors, such as the participant's overall health.

Grouping the results by theme helped analyse the results, but could have overlooked other areas that impact QoL because of DC, which may of introduced some researcher bias.. The use of inferential analysis and triangulation would have provided more depth in the conclusions.

These limitations should be considered when interpreting the findings, and further research using mixed-methods or qualitative methodologies across multiple centres would strengthen the evidence base.

Conclusions:

The study investigated the impact of DC on QoL in SRS patients at a single centre. This has become relevant due to the increase in survival of patients with BM because of earlier diagnosis, regular surveillance MRIs, targeted drugs, immunotherapy and improved management of side effects, resulting in a higher QoL, many of whom have no obvious reduced neuro-cognitive dysfunction.

The responses have shown that there is a detrimental effect on QoL across all QoL themes (mobility, independence, social, depression, and restriction, and overall QoL), with each aspect intermingling.

The study agrees with other studies that QoL is a multifactorial, complex, and subjective concept encompassing physical, social, independence, mobility, mental, and well-being, [3,33] and that QoL should be measured before and after treatment to provide evidence to recommend a treatment to a patient.[36,37] Research in other fields of medicine links DC to deteriorating health,[23] so it is important to recognise this risk and incorporate DC QoL questions into existing questionnaires.

The transition to DC is often challenging, and further support needs to be considered for all cancer patients. Further research into the subject may provide evidence to challenge the current DVLA requirements and move towards individualised driving advice. The research also highlights that intervention programmes may help reduce the impact and may open discussions with the primary teams about when in the pathway patients should be informed of the risk and who is best placed to deliver this information.

Areas that require more detailed research that were omitted in this study are the role relatives play in lessening the impact DC has on a partner and the role the DVLA has in making the process less stressful.

References:

1. James, J., Albarran, J. W., & Tagney, J. (2001). The experiences of ICD patients and their partners with regards to adjusting to an imposed driving ban: a qualitative study. *Coronary Health Care*, *5*(2), 80-88. https://doi.org/10.1054/chec.2001.0124
2. Sanford, S., Rapoport, M. J., Tuokko, H., Crizzle, A., Hatzifilalithis, S., Laberge, S., ... & Canadian Consortium on Neurodegeneration in Aging Driving and Dementia Team. (2019). Independence, loss, and social identity: Perspectives on driving cessation and dementia. *Dementia*, *18*(7-8), 2906-2924. https://doi.org/10.1177/1471301218762838
3. Patterson, L., Mullen, N., Stinchcombe, A., Weaver, B., & Bédard, M. (2019). Measuring the impact of driving status: The Centre for Research on Safe Driving–Impact of Driving Status on Quality of Life (CRSD-IDSQoL) tool. *Canadian Journal of Occupational Therapy*, *86*(1), 30-39. https://doi.org/10.1177/0008417418824980
4. Worldmeter 2022 U.K. Population (2022) - Worldmeter (worldometers.info) [Accessed 29/01/2026]
5. Valencia-Sanchez, C., Gorelkin, V. C., Mrugala, M. M., Sharma, A., Vora, S. A., Ashman, J. B., ... & Porter, A. B. (2019). Clinical evaluation of fitness to drive in patients with brain metastases. *Neuro-oncology practice*, *6*(6), 484-489. https://doi.org/10.1093/nop/npz027
6. Lamba, N., Catalano, P. J., Cagney, D. N., Haas-Kogan, D. A., Bubrick, E. J., Wen, P. Y., & Aizer, A. A. (2021). Seizures among patients with brain metastases: a population-and institutional-level analysis. *Neurology*, *96*(8), e1237-e1250.
7. Voluntarily surrendering your driving licence - GOV.UK 2024 [Accessed 29/01/2026]
8. Weir, N., Fischer, A., & Good, P. (2017). Assessing the practice of palliative care doctors: what driving advice do they give patients with advanced disease? *Internal medicine journal*, *47*(10), 1161-1165. https://doi.org/10.1212/wnl.0000000000011459
9. Thomas, S., Mehta, M. P., Kuo, J. S., Robins, H. I., & Khuntia, D. (2011). Current practices of driving restriction implementation for patients with brain tumors. *Journal of neuro-oncology*, *103*(3), 641-647. https://doi.org/10.1007/s11060-010-0439-7

10. Mansur, A., Desimone, A., Vaughan, S., Schweizer, T. A., & Das, S. (2018). To drive or not to drive, that is still the question: current challenges in driving recommendations for patients with brain tumours. *Journal of neuro-oncology*, *137*(2), 379-385 https://doi.org/10.1007/s11060-017-2727-y
11. Pellichero, A., Lafont, S., Paire-Ficout, L., Fabrigoule, C., & Chavoix, C. (2021). Barriers and facilitators to social participation after driving cessation among older adults: A cohort study. *Annals of Physical and Rehabilitation Medicine*, *64*(2), 101373. https://doi.org/10.1016/j.rehab.2020.03.003
12. Kim, Y. S., Shin, H., & Um, S. (2023). The Subjective Experiences of Driving Cessation and Life Satisfaction. *Behavioral Sciences*, *13*(10), 868. https://doi.org/10.3390/bs13100868
13. Lane, M. (2023). The Impact of Driving Cessation on Quality of Life in Older Adults. *The Graduate Review*, *8*(1), 39-51. https://vc.bridgew.edu/grad_rev/vol8/iss1/6
14. Yeoh, S. F., Oxley., Ibrahim, R., Hamid, T. A., Norazizan, S., Rashid, S.N.S. (2017) Measurement Scale Development for Mobility-Related Quality of Life among Older Malaysian Drivers. Drivers International 43: 265. https://doi.org/10.1007/s121
15. Harrison, A., & Ragland, D. R. (2003). Consequences of driving reduction or cessation for older adults. *Transportation Research Record*, *1843*(1), 96-104. https://doi.org/10.3141/1843-12
16. Sartin, E. B., Ruggieri, D. G., Diogo, A., O'Malley, L., London, L., & Curry, A. E. (2022). Impacts of Non-Driving Related License Suspensions on Quality of Life: a Qualitative Stud. *Applied Research in Quality of Life*, *17*(4), 2211-2227. https://doi.org/10.1007/s11482-021-10027-7
17. Mielenz, T. J., Jia, H., DiGuiseppi, C., Molnar, L. J., Strogatz, D., Hill, L. L., ... & Li, G. (2024). Impact of driving cessation on health-related quality of life trajectories. *Health and quality of life outcomes*, *22*(1), 13. https://doi.org/10.1186/s12955-024-02231-4
18. Buys, L. R., & Carpenter, L. (2002). Cessation of driving in later life may not result in dependence. *Australasian Journal on Ageing*, *21*(3), 152-155. https://doi.org/10.1111/j.1741-6612.2002.tb00437.x?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle

19. Savoie, C., Voyer, P., Lavallière, M., & Bouchard, S. (2024). Transition from driving to driving-cessation: experience of older persons and caregivers: a descriptive qualitative design. *BMC geriatrics*, *24*(1), 219. https://doi.org/10.1186/s12877-024-04835-3
20. Murray, A., & Musselwhite, C. (2019). Older peoples' experiences of informal support after giving up driving. *Research in Transportation Business & Management*, *30*, 100367. https://doi.org/10.1016/j.rtbm.2019.100367
21. Curl, A. L., Stowe, J. D., Cooney, T. M., & Proulx, C. M. (2014). Giving up the keys: How driving cessation affects engagement in later life. *The Gerontologist*, *54*(3), 423-433. https://doi.org/10.1093/geront/gnt037
22. Siren, A., & Haustein, S. (2015). What are the impacts of giving up the driving licence? *Ageing & Society*, *35*(9), 1821-1838. https://doi.org/10.1017/S0144686X14000610
23. Chihuri, S., Mielenz, T. J., DiMaggio, C. J., Betz, M. E., DiGuiseppi, C., Jones, V. C., & Li, G. (2016). Driving cessation and health outcomes in older adults. *Journal of the American Geriatrics Society*, *64*(2), 332-341. https://doi.org/10.1111/jgs.13931
24. Ragland, D. R., Satariano, W. A., & MacLeod, K. E. (2005). Driving cessation and increased depressive symptoms. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *60*(3), 399-403 https://doi.org/10.1093/gerona/60.3.399
25. Holden, A., & Pusey, H. (2021). The impact of driving cessation for people with dementia–An integrative review. *Dementia*, *20*(3), 1105-1123.j https://doi.org/10.1177/1471301220919862
26. Scott, I., & Mazhindu, D. (2014). *Statistics for healthcare professionals: An introduction*. Sage. London
27. NICE (2018) guidelines for Care Needs of People with Brain Tumours (updated 2021) https://www.nice.org.uk/guidance/ng99 [Accessed 29/01/2026],
28. Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. Sage publications.
29. Oxley, J., & Whelan, M. (2008). It cannot be all about safety: the benefits of prolonged mobility. *Traffic injury prevention*, *9*(4), 367-378. https://doi.org/10.1080/15389580801895285

30. Qin, W., Xiang, X., & Taylor, H. (2020). Driving cessation and social isolation in older adults. *Journal of aging and health*, *32*(9), 962-971 https://doi.org/10.1177/0898264319870400
31. Pitman, A., Suleman, S., Hyde, N., & Hodgkiss, A. (2018). Depression and anxiety in patients with cancer. *BMJ*, *361* https://doi.org/10.1136/bmj.k1415
32. Verhaak, E., Schimmel, W. C., Gehring, K., Emons, W. H., Hanssens, P. E., & Sitskoorn, M. M. (2021). Health-related quality of life after Gamma Knife radiosurgery in patients with 1–10 brain metastases. *Journal of Cancer Research and Clinical Oncology*, *147*(4), 1157-1167. https://doi.org/10.1007/s00432-020-03400-w
33. Thavarajah, N., Bedard, G., Zhang, L., Cella, D., Beaumont, J. L., Tsao, M., ... & Chow, E. (2014). Psychometric validation of the functional assessment of cancer therapy—brain (FACT-Br) for assessing quality of life in patients with brain metastases. *Supportive Care in Cancer*, *22*(4), 1017-1028. https://doi.org/10.1007/s00520-013-2060-8
34. Haraldstad, K., Wahl, A., Andenæs, R., Andersen, J. R., Andersen, M. H., Beisland, E., ... & Helseth, S. (2019). A systematic review of quality of life research in medicine and health sciences. *Quality of life Research*, *28*(10), 2641-2650. https://doi.org/10.1007/s11136-019-02214-9
35. EQ-5D-3L (1990) EuroQol Research Foundation. UK (English) v2.1 Retrieved from EQ-5D-3L – EQ-5D (euroqol.org) [Accessed 29/01/2026]
36. Steinmann, D., Schäfer, C., van Oorschot, B., Wypior, H. J., Bruns, F., Bölling, T., ... & Vordermark, D. (2009). Effects of radiotherapy for brain metastases on quality of life (QoL). *Strahlentherapie und Onkologie*, *185*(3), 190-197. https://doi.org/10.1007/s00066-009-1904-0
37. Fernandez, G., Pocinho, R., Travancinha, C., Netto, E., & Roldão, M. (2012). Quality of life and radiotherapy in brain metastasis patients. *Reports of Practical Oncology and Radiotherapy*, *17*(5), 281-287. https://doi.org/10.1016/j.rpor.2012.08.003
38. de Boisanger, J., Brewer, M., Fittall, M. W., Tran, A., Thomas, K., Dreibe, S., ... & Rosenfelder, N. (2024). Survival after stereotactic radiosurgery in the era of targeted therapy: number of metastases no longer matters. *Current Oncology*, *31*(6), 2994-3005. https://doi.org/10.3390/curroncol31060228
39. The Brain Tumour Charity | Research - Support - Campaigning