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## Brünnhilde Bleeds: The Impact of Hormonal Changes on the Professional Dramatic Soprano

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**ABSTRACT:** The dramatic soprano is not a beginner's voice type. The late maturation of dramatic voices, both male and female, is a well-documented phenomenon and presents challenges for the dramatic singer that are not encountered by lighter voices or other musicians. The instrument of the dramatic soprano matures in her mid-thirties to mid-forties, and she can still be performing dramatic roles in her late 60s. It has also been well documented that during these ages, women's bodies undergo vast hormonal changes related to fertility, pregnancy, perimenopause and menopause. Recent scholarship on the effects of female hormonal changes, in particular perimenopause and menopause, have mainly focused on the speaking voice or the singing voice of amateur and choral singers. However, the effects of hormonal changes on the professional female operatic singing voice are under researched. This article reports the results of life history interviews with 13 professional female singers who have sung dramatic Wagnerian roles, particularly that of Brünnhilde, between the ages of 43 and 68. The embodied experience of these singers is that although hormonal changes related to ageing can affect the voice, these effects can be mitigated and addressed through technical training of the voice and physical training of the body, and for some singers, by hormone and alternative therapies. These interviews also reveal a range of concerns among professional singers about the implications of speaking out about the effects of hormonal changes on their voices. Critically, this points to why such experiences may have remained understudied.

**KEYWORDS:** Dramatic soprano, hormonal changes, fertility, pregnancy, perimenopause, menopause, life history interviews, Brünnhilde, misogyny, women's bodies

### INTRODUCTION

*"...daß wissend würde ein Weib!"* - Brünnhilde's Immolation Scene, Act III *Götterdämmerung*

*"...that wise a woman might grow!"* - Frederick Jameson English Libretto (Muraashev, 2016)

This article reports findings from life history interviews undertaken by the author with 13 professional singers who have performed the role of Brünnhilde, or other substantial Wagnerian roles, regarding their experiences of the effects of female hormonal changes on the voice.<sup>1</sup> Questions were devised to answer the main research question: "How does an emerging female dramatic singer build a voice, body and psyche to sing dramatic roles from the classical operatic repertoire, like Brünnhilde in Wagner's Ring Cycle operas?" Interviewees ranged in age from 43–68, and hormonal changes discussed included menstruation, pregnancy, fertility treatment, thyroid conditions, perimenopause, and menopause.

There is a gap in the literature regarding professional singers' experiences of navigating hormonal changes, which will be elaborated below. The findings from this study go some way to addressing this gap and suggest avenues for further study. The interviews also suggest why this gap exists through revelations of concerns among professional singers regarding the implications of complaining or speaking out about negative

experiences associated with professional voice use.

Understanding the effects of hormonal changes on female singers' voices and the strategies they engage to address these issues is argued to be essential knowledge for the training and career development of female singers. Additionally, this knowledge is important to dispel potential myths, stereotypes and misinformation about the impacts of hormonal changes on female voices that sometimes inform casting or disparaging discussions regarding female singers in the opera industry.

The singers interviewed gave permission to be identified with respect to their responses; however, given the broader concerns raised by the participants about the implications of speaking out and disclosing vocal struggles specifically related to age and hormonal changes, participants have been assigned randomly chosen names of Wagnerian heroines to increase their confidentiality (Lahman et al., 2015). These names do not necessarily correlate with roles the singers have sung professionally but add to the narrative quality of the life history interviews and reflect that all the women interviewed have performed large Wagnerian roles.

## HORMONES AND THE FEMALE VOICE

Research into the effects of hormonal changes on the female voice is a relatively recent discipline in the voice sciences. Groundbreaking research was reported in 1999 by Abitbol et al. documenting a study of 197 women with either premenstrual or menopausal voice syndrome (Abitbol et al., 1999). This report also critiqued the historical and cultural context that has often been a barrier to understanding the female voice, body, and health. Indeed, this research may never have been conducted if Jean Abitbol's "classic patriarchal medical response: It's all in your head" (Bernstein, 2005, p. 23) to coloratura sopranos' complaints of difficulties singing before their menses had not been challenged by his gynaecologist wife, Beatrice Abitbol.

Influenced by research in the 1980s, which documented pre-menstrual syndrome (Massil, 1986), the Abitbols collaborated on initial studies that investigated the similarities between the mucosal smears of the vocal cords and the cervix. The similarities in the cellular makeup of the two tissues led the researchers to conclude that "the larynx is indeed a 'target organ' for hormonal change" (Bernstein, 2005, p. 24). The studies

reported in 1999 by the Abitbols led them to conclude that "hormones are the dominant factor in determining voice changes throughout life" (Abitbol et al., 1999, p. 424), as oestrogen, progesterone, and testosterone all influence the evolution of the female voice from childhood to menopause; and harmonics, which characterise the voice alongside its intensity and frequency, are hormonally influenced.

It is now well documented that hormonal changes have been shown to have a significant impact on the female voice. During the menstrual cycle, hormone levels fluctuate, which can cause changes in vocal fold tension, vocal fold thickness, and vocal fold mucosal wave characteristics. These physiological changes can result in alterations in vocal pitch, range, and quality, as well as decreased vocal endurance and increased vocal fatigue (Oberlander, 2010; Wicklund, 1996). The effects of hormonal contraceptive pills on the voice (Rodney, 2019) and the irreversible effects on the female voice of androgenic therapies for endometriosis and some contraceptives have also been extensively studied and reported in medical and singing journals (Sataloff et al., 1998).

Pregnancy is another period of significant hormonal change that can impact the female voice. Studies have shown that during pregnancy there is an increase in oestrogen and progesterone levels, which can lead to changes in vocal fold characteristics and vocal function. These changes can result in alterations in vocal pitch, range, and quality, as well as decreased vocal endurance and increased vocal fatigue, most of which resolve after pregnancy (Hamdan et al., 2009; Lã & Sundberg, 2012). The generalisation of these findings to singers is not fully clear, as Hamden et al.'s study related to the speaking not singing voice, and there was only one subject in the study by Lã and Sundberg even though the subject was a semi-professional classically trained singer whose vocal tasks were diminuendo sequences and the performance of a Lied.

Similarly, there have been studies into the effects of the decrease of oestrogen levels evident during perimenopause, the transitional period leading up to menopause, and post-menopause (D'Haeseleer et al., 2011; Monteleone et al., 2018; Sataloff, 1996). While these studies are primarily concerned with the effect of hormonal changes on the voice, they also highlight that some of the changes experienced by women are related to the effects of ageing on vocal characteristics. Sataloff advocates that women experiencing vocal difficulties during this time can "reverse some of the aging process through voice therapy and/or

regular vocal training and physical exercise” (Sataloff, 1996, p. 41). He also suggests that “women experiencing vocal difficulties due to menopausal factors should not abandon their singing/teaching careers. Instead, hormone replacement therapy using oestrogen should be initiated” (Sataloff, 1996, p. 41).

This advice is still controversial, as “hormone replacement therapy is an effective treatment for all of the symptoms of menopause, but has significant risks” (Heman-Ackah, 2004, p. 474). Heman-Ackah cautioned singers who suspect they are suffering from the effects of menopausal voice syndrome to not just rely on the advice of singing teachers or other singers, but to carefully consult a physician to determine her individual risks associated with taking hormone replacement and also with a laryngologist to determine whether hormone replacement therapy is appropriate for their specific vocal condition.

## HORMONAL CHANGES AND THE FEMALE SINGING VOICE

Despite this welcome research into women’s vocal health and general wellbeing, it is important to distinguish that many of the quantitative studies are concerned with the speaking voice or the singing voice of non-professional singers. This advice is general at best, and at worst, irrelevant to “professional singers who use their vocal instrument in a much more demanding way with respect to pitch, dynamic range, and duration, and who perform more complex vocal motor tasks than speakers or un-trained singers singing simple tunes” (Ryan & Kenny, 2009, p. 99). This has prompted growing interest in qualitative studies by performer-researchers into the effects of hormonal changes on professional singers and the strategies employed by these singers to mitigate the effects of hormonal change.

Maree Ryan’s own methodology for her master’s research into the perceived effects of the female hormonal cycle on young female classical singers (Ryan, 2006) critiqued the Abitbols’ study (Abitbol et al., 1999) of 97 trained female singers who complained of PMS. Ryan discriminated that the vocal stimulus “Frère Jacques, a French folk song...although more challenging than speaking or sustaining vowels, it is still far removed in difficulty from the daily expectations of a professional singer” (Ryan & Kenny, 2009, p. 100). Ryan’s study involved tertiary singing students from the Sydney Conservatorium of Music. The study concluded that although the

singers reported subjective changes in their voices during certain phases of the menstrual cycle and these singers could perceptually identify these differences in recordings, discernible differences were not detected by expert vocal pedagogues with accuracy. Ryan and Kenny concluded: “The study demonstrated that self-awareness of the artist is much more sensitive and critical than the perception of a highly trained observer, implying that audience satisfaction is not necessarily as difficult to achieve as self-satisfaction” (2009, p. 108).

The experiences of nine elite female opera singers as they went through menopause and the impacts on their singing voices was documented in DMA research by Barbara Fox DeMaio (Fox DeMaio, 2013). The study found that menopause can lead to changes in vocal production and that some singers may experience a loss of vocal range and endurance, but this was not experienced by all singers, and some reported that their high range had increased. The study also found that with proper care and attention, the negative changes can be managed and menopause does not necessarily mean the end of a singer’s career. Most of the singers interviewed were still performing professionally but attributed shorter careers to “a result of growing older in a profession that values youth and beauty” (Fox DeMaio, 2013, p. 100). The study ultimately concludes that more research is needed in this area to better understand the specific changes that occur and how they can be addressed, but also suggests that professional singers are hesitant to reveal this kind of information publicly as “elite singers rarely discuss their voice problems in public because any hint of vocal distress can negatively affect their careers” (Fox DeMaio, 2013, p. 3).

Princeton University performance faculty member Martha Elliott’s own experience “began a journey, often frustrating and painful, yet also full of discovery that led to ... creating the 2014 Singing Through Menopause Survey” (Elliott, 2017, p. 269). In line with Fox DeMaio’s evaluation that elite singers are hesitant to discuss their vocal problems, Elliott observes that “female singers throughout history have gone through menopause, but not many have talked about the vocal ramifications openly” (Elliott, 2017, p. 277).

Frustration with the generalised nature of studies on hormonal change and the female voice led to the publishing of *Singing Through Change* in 2020 by professional singers and pedagogues Cate Frazier-Neely, Joanne Bozeman and Nancy Bos (Bos et al., 2020). Bozeman shared on the VocalScope podcast that the qualitative method

was one of the reasons she was interested in collaborating on the book: “Just relating statistics from the few studies that we have, it doesn’t really elaborate, it sort of flattens down experiences and turns it into averages. So when they said we want to tell stories, a form of qualitative research, I said, ‘this is the way to go’” (Caton, 2021). The book has been well received by the singing community, with numerous journal articles, podcasts and an active Facebook community of almost 3000 people (Bos et al., 2021; Caton, 2021).

There are few accounts of the effects of hormonal changes in the biographies of professional opera singers. The singers who have shared these struggles are often reflecting on extremely successful careers from the relative safety of retirement. Like the qualitative inquiries into the effect of hormonal change on the professional singing voice, these biographical accounts from singers offer more nuanced views of vocal changes and strategies that enable singers to continue to perform at an elite level than the quantitative studies described above. They also provide insights into some of the systemic issues in the opera industry that cause women to avoid open discussions of the effects of female hormonal changes on the voice.

In her autobiography, Beverly Sills outlined how her menstrual cycle affected her vocal cords: “One thing I was acutely aware of was the effect of hormones on my vocal cords. My voice, which had always been reasonably consistent, would change considerably at different times of the month” (Sills & Linderman, 1988, p. 52). Marilyn Horne also mentioned experiencing menstrual cramps and other menstrual-related discomforts during her career. She reflected that she was often criticised by male conductors and directors for being "difficult" during her periods (Horne & Scovell, 2004).

By comparison, there are significantly more accounts from famous singers of their perceptions of the effects that perimenopause and menopause had on their voices. Some, like Brigitte Fassbaender, credited early retirement at 56 in part to the effects of menopause and ageing on the voice (Fassbaender, 2019). By contrast, Jessye Norman and Frederica Von Stade discussed how they were able to continue their singing careers and mitigate the effects of menopause on their voices by adapting their repertoire and being careful about how they use their voice (Gloss, 2020; Norman, 2014). At 55 years of age, Renée Fleming raised concerns about her casting and vocal longevity: “If I were a mezzo or I were a dramatic soprano then there are those parts, those

character parts, but for the soprano voice there’s almost nothing after a certain age” (Roddy, 2014). Inspiringly, at 64 years of age, Renée Fleming has continued to record and perform extensively, including the commissioning and premiere of *The Hours* at The Metropolitan Opera in 2022 and Pat Nixon in *Nixon in China* at the Paris Opera in 2023, crediting her “fastidious technique and strong instinct to protect her voice” (Miller, 2023).

Probably the most candid account of menopausal-related vocal issues appeared in Christa Ludwig’s autobiography (Ludwig & Domeraski, 1999). She recounted her vocal crisis precipitated by her cancelled performances of Eboli at the Salzburg Festival under Karajan in 1975. Changes of repertoire, care of her vocal technique and cancelling if unwell, allowed her to recover her professional career and sing for another twenty years. She is adamant, however, that “the mistake that women and singers make is not talking about these problems. The subject is taboo, because a woman would be admitting that she is getting old” (Ludwig & Domeraski, 1999, p. 240).

## METHOD

Thirteen female singers who had sung the role of Brünnhilde or other large Wagnerian roles were invited to participate in life history interviews. The interviewees’ careers ranged from opera houses in America, the United Kingdom, Germany, UK, Asia and Australia, and in opera houses including The Metropolitan Opera, English National Opera, Royal Opera House, Bayreuth, Opera Australia, and other substantial opera houses and concert halls in Europe and Asia.

The ages of the singers ranged from 43–68 years with the distribution of age ranges as specified below:

40 - 45	1 singer
46 - 50	5 singers
51 - 55	2 singers
56-60	3 singers
60-plus	2 singers

**Table 1.** Distribution of ages

Of the thirteen singers, all were still performing professionally aside from two, one from the 60-plus year category who was teaching singing at a well-regarded American Conservatory, and the other from the 46–50 age category who no longer pursues a singing career.

Regarding hormonal life stages, of the thirteen singers, five would be considered perimenopausal as they were still menstruating or, in the case of Ortlinde, they were taking contraceptive medication to avoid menstruation but had no other symptoms of menopause. Two had undergone hysterectomies and could not confirm if they were perimenopausal or post-menopausal, though Helmwigge suggested in interview that due to other symptoms, she believed she had reached menopause and was having a blood test to check; consequently her responses are included in the post-menopause section. Seven of the interviewees were post-menopause. Regarding pregnancy and fertility, three of the singers had children and at least two of the singers who did not have children disclosed they had undergone fertility treatment. Two of the singers were taking hormonal thyroid medication that can have an effect on the voice, but discussion of this is beyond the scope of this article. The full breakdown of participant data is included in Appendix 1.

The life history method was selected, as the detailed interview schedule and process of “negotiation and collaboration” (Frisch, 1990) engaged in by the interviewer and interviewee “reduces the chance of the interviewee giving a purely sanitised version of events” (Jackson & Russell, 2010, p. 6) already on the public record. The method was chosen as the published literature surrounding the mid-career transitions of dramatic female voices is most often contained in the popular opera press. Such interviews are often promotional media for singers and their performances and are therefore unlikely to probe issues of technical or psychological difficulty experienced by these singers during their mid-career transition. This method also acknowledges and attempts to mediate against Fox DeMaio’s supposition that one of the barriers to research in this area is the unwillingness of professional singers to disclose a “hint of distress” (Fox DeMaio, 2013, p. 6)

It is acknowledged in life history interviewing that the selection of interviewees and the research agenda of the interviewer shapes the material collected. As a female researcher studying the career transitions of female singers, the researcher took a feminist and intersectional approach to her questions and research sample. The background of the researcher as a female opera singer with a dramatic voice was acknowledged as “identity and the context of both researchers and participants was central to the

research process” (Ryan-Flood & Gill, 2010, pp. 4-5).

Interviews ranged from 1–2.5 hours and were conducted online and recorded and transcribed using transcription software Otter.ai (AISense, 2018). Questions were devised to answer the main research question: “How do you build a Brünnhilde in voice, body and psyche?” and were grouped into 3 main sections: (1) education and training, (2) rebranding: stepping back into professional life, (3) visibility: public and private concerns.

Questions regarding the hormonal changes of participants were raised in the third section of the interview. The detailed interview schedule set out two questions regarding hormonal changes. The first question asked: “The 30s and early 40s are also a time when women are constantly bombarded with messaging that their fertility is dropping, and it is a crucial time if they are intending to have children. Did this type of messaging have a personal impact on you or your career plans?” The second question enquired: “Given the age in which dramatic sopranos are ‘in their prime’, is it likely that these singers will deal with the physical effects of transitions such as perimenopause and menopause on the voice? Do you have any insights as to how these transitions have affected you (or are potentially going to affect you)?” All participants were asked these questions or a variation of these questions depending on what they had revealed in the prior discussion. The second question often sparked a discussion about the interviewee’s experiences of menstruation as well as perimenopause and menopause.

Responses were coded using standard qualitative software NVivo 12 Pro (QSR, 2018). In primary coding I used overarching codes suggested by the research questions – “fertility”, “perimenopause” and “menopause”. Second round coding and familiarity with the data prompted sub-codes such as “mitigation strategies”, “prior knowledge”, “sharing knowledge” and “speaking out - concerns” were added to reflect the themes and concepts repeated in the interviews.

## EFFECTS

### Menstruation

There was a wide variety of experiences regarding the effects of the menstrual cycle on the singing voice. Helmwigge reported, “I’ve been incredibly lucky. My friends hated me. I was a three day and

done girl my entire life. Like no big deal. Get some crampies [cramps]. I'm good, fine." Both Isolde and Ortrude commented that it is never much fun to have to perform a long and taxing operatic role when menstruating, but neither remembered menstruation having deleterious effects on their voice or singing. Schwerleite commented similarly that she didn't have "huge issues" with menstruation affecting her voice and as an aside commented that "COVID had more of an effect" on her voice.

By contrast, Ortlinde reports she has always had difficulty singing for a week around her period as everything "is so swollen", including her vocal cords. She tested her theory and body during COVID lockdowns and found that:

Because I knew there were no auditions or anything, so I thought I might try out what happens because, I mean, it's been about 20 years now that I have taken these hormones. What happened was that I felt like in the beginning of my 20s again, I couldn't sing for about a week when I had my period and I still have strong changes with my body during the cycle so I have to take something if I want to sing.

Grimgerde also reported she suffered from premenstrual oedema. She laughed when she relayed having this symptom confirmed: "an ENT has looked and gone 'you're about to have your period' and I'm going 'how on earth can you see that?' 'Well, that's because I looked at your vocal folds two weeks ago when you had laryngitis and now they're more swollen' - so great! [laughs ruefully]". This was a relief to Grimgerde as she commented: "I used to think oh, I'm just a bit rubbish. And actually there's a reason and I quite liked that."

Waltraute also gave a detailed account about how her voice and body responds to the monthly cycle of hormonal changes, which was something she noticed in more detail after having several rounds of fertility treatment.

It's made me aware of the different hormones, how they affect the body. In the cycle, I have like windows where I sing like a goddess and then I know that there are times where I shouldn't expect much. But during that time, it was as if aliens had taken over my body. I had this weird, my consciousness was sort of outside my body. And that's not a good state to be in when you need to sing. I managed to do whatever I was hired to do. I just didn't feel good about it. And I was not happy during that time. So mentally, emotionally, I was not myself. Yeah, that was the general feeling.

These three singers gave detailed accounts of how they mitigate these symptoms. Ortlinde believed she must be on a constant dose of hormonal contraceptive medication in order to flatten the ups and downs of the menstrual cycle. Grimgerde preferred to avoid hormonal interventions like the contraceptive pill and expressed concerns about the long-term effects of that approach. Instead, she preferred to take a natural approach and follows the advice of her ENT to do a longer vocal warm up and go for a run to take down the inflammation in the body. She also cautioned that singers are more likely to injure themselves in the oedematic phase, so it is important to sing with: "your best technique ... and not take stupid risks about singing in your middle voice really high."

Waltraute tried to plan her singing schedule so that she could avoid auditions during what she termed "the more introverted phase" of the cycle, where "I can normally sing but sometimes I have this feeling of sort of where the voice is sort of swollen and doesn't want to do anything that I asked it to". She commented that sometimes performances can't be avoided during this time, but like Grimgerde, the singer must be more careful:

I did a few Valkyries on not the best type of hormones and also on full menstruation and I survived that, but you know, then you need even more rest, restoration, and you also need to be more careful during the actual singing.

While the singers had a range of experiences regarding the effect of the menstrual cycle on their voice, they had all taken their menstrual cycle into consideration when performing, dealing with issues ranging from discomfort to more serious vocal issues requiring medical intervention.

### Perimenopause and Menopause

All the singers interviewed were aware that perimenopause usually occurs around the early forties and can extend into a woman's fifties. They also recognised that perimenopause and menopause could bring about changes in their bodies that might affect their singing and careers. For the six women who have not experienced menopause, they had some preconceptions about what might happen but acknowledged that like menstruation, women can have a range of experiences regarding this hormonal transition.

It was described as a "juggling act" by Siegrune to manage these changes while continuing to perform. However, for the women

who were post-menopause, they also acknowledged that once they reached menopause, it can be a positive experience.

During interviews, many of the women used the word menopause or “going through menopause” to describe symptoms that may be better described as perimenopausal symptoms. For this reason, this section will be divided into three sections: in the first two sections, *Physical Symptoms of Perimenopause* and *Fear of Menopause*, all of the women’s experiences will be discussed, but in the third section, *Post-Menopause*, only the experiences of the six women who are post-menopause will be discussed.

### PHYSICAL SYMPTOMS - PERIMENOPAUSE

While there was a range of physical symptoms reported by the women, three women interviewed—Isolde, Ortrud and Schwerleite—all reported that they did not notice any detrimental changes to their voices during perimenopause or menopause. Schwerleite was open to age and hormonal-related changes but hadn’t really noticed anything she would attribute specifically to menopause. She noticed that COVID-19 and her subsequent recovery had more of an effect on her voice than any hormonal transitions. Schwerleite recognised that her voice has changed and evolved as she has aged and developed strength and technical prowess, enabling her to transition from lyric mezzo roles to dramatic soprano roles and now Wagnerian mezzo roles, but she did not attribute this to hormonal changes. Similarly, Ortrud remarked that:

My voice obviously matured and changed a bit. But I always had a slightly darker sound in my voice, but it's still a soprano. And I always tried to sing with bright vowels, because I think that's the healthiest way to sing.

This mitigation of vocal changes via singing with optimal vocal technique and continuing to work on vocal technique with trusted teachers and coaches was reflected in all the interviews and will be further discussed in section three *Post-Menopause*.

Isolde and Gerhilde did not attribute any vocal changes specifically to hormonal transitions, but they did comment on the physical changes their bodies went through during this time, which made the job of being an opera singer more difficult. Gerhilde gives a harrowing account of her experience of perimenopause:

My body went on a complete rampage. I mean, I was the woman who slept two, three hours a night. I lost, like 40 pounds. I couldn't eat. I couldn't sleep. It was like somebody plugged me into a wall. My adrenal system had gone completely off the charts. I thought it was my mind. I thought I was going crazy. There was no literature. There was no widely available discussion about – No! This is perimenopause. This is your body reacting to a lack of oestrogen. There is support there for you. Nobody talks about that.

Isolde also had terrible physical symptoms:

Now the perimenopause, you know, last couple of years of having a period were hell because you know, everybody's different. But for me, the perimenopause was atrocious, painful, constant periods, heavy periods, you know, to the point of, you know, just you thought you were going to pass out half the time.

Similarly, Helmwig found her bleeding during perimenopause so difficult that for a few days she could not leave her apartment to fulfil her rehearsal obligations at one of the most famous opera houses in the world. After this experience, she contacted her doctor and said she would accept her advice that she needed a hysterectomy. Helmwig’s caveat was that the doctor was not to take her ovaries as she was afraid this would send her into menopause and that would have a career limiting effect. For non-singers, it is possibly difficult to understand how Helmwig could choose between her health and her singing career, but the following exchange goes some way to understanding the fear many female singers have of the effect of menopause on the voice:

She goes, "You know, I want your ovaries" and I said, "You can't have them. You 100% can't have them. You can take everything else." And she said, "Ovarian cancer" and I said, "My mortgage". She said, "I have never met anybody that I am allowing to do this. But you are the first person that I actually understand why. And you get your butt in here every six months so we can scan" – "Fine."

For these women, the negative symptoms of perimenopause and menopause that affect their body, wellbeing and performance abilities may also significantly affect their earning potential as professional singers.

### FEAR OF MENOPAUSE

Almost all the singers interviewed had some degree of fear about what menopause might do to

their voices, and many admitted they must have made this assumption from hearing or reading negative accounts. There were two exceptions to this finding: the first was Elsa, who did not engage very much with the questions on hormonal changes as the discussion went in another direction regarding an elective hysterectomy and changing career from singing in her early 40s—both of which are beyond the scope of this article. The second was Ortrud, who cited the positive account of Dame Joan Sutherland, who retired at 63 and was, in Ortrud's opinion, still singing "as great as she ever was".

For all the other singers, they cited a range of worries from depression, forgetfulness and a need to use music in concerts, to needing to watch their hydration in case the voice was affected by dryness associated with menopause. One of the women, Roßweise, had gone on Hormone Replacement Therapy (HRT) early while still in perimenopause as she believed there is a common assumption that is fueled by misogyny in the industry:

I don't want to have people like my agent saying, "Oh, her voice is gone because of menopause". So I went and consulted specialists. And I just said, "I don't want my voice to change". And they said, "Well just delay it for five years and just go on this." So that's what I'm doing. ... I'm just playing the system. Because I think there's a real misogyny in the industry as well. Male artistic directors love to say "Oh, when she got the menopause, the voice went, you know?" So I'm just like, "Well, then I won't get it".

This comment regarding misogyny in the industry was alluded to in various ways by all the interviewees. Singers described the way their weight, looks and age were discussed by (mostly male) casting directors, agents and reviewers. Regarding ageism, many of the singers would not disclose their actual age and one in particular said her agent regularly lied about her actual age, taking off 8 years. Some discussed gendered labels such as "bitter bitch" and "diva" that they garnered if they were too outspoken, as well as the belief that post-menopausal voices were undesirable due to a perception that their voice and vibrato might sound "old" and they might lose the top of their voice.

Considering the experiences regarding misogyny in the industry, Gerhilde's remarks were enlightening regarding the pressure these women reported feeling to not draw attention to their age or hormonal changes associated with female ageing, and showed a curious use of gendered

language to describe having confidence to speak out:

And if I were ballsier, I would, I would start that conversation, if I had more balls, which I don't quite yet but maybe I will grow them, you know, in my old age become the big proponent for 40 somethings to start having a conversation about hormone replacement therapy.

While all the women were very open about discussing their experiences of these hormonal transitions with me in interview, they did comment that these conversations were usually reserved for peer-to-peer conversations often held in the relative privacy of the women's dressing room. They also commented that without these types of discussions, they often had no knowledge of the way hormonal changes may affect their voice or careers. Sieglinde captured these ideas, saying:

When I did the Opera North Ring. That's the first time I've heard other woman talk about, like, maybe you might need HRT or something for the voice because suddenly there were all these women sharing a dressing room—woman of a certain age and working at a certain level going, "Oh yeah, you might need to do this and you might need to do that" and you're just overhearing and going, "Okay, really interesting information for my future".

These conversations held in private suggest that female singers are often generous in sharing their knowledge of these transitions with each other, but wary of having these conversations in more public forums.

## POST-MENOPAUSE

As outlined above, of the seven women who would consider themselves post-menopause, four didn't attribute changes in their voices to hormones. Yet, this is not to say that they did not notice changes in their voices over time. All the singers interviewed agreed that the voices of professional female opera singers change in response to age, weight, repertoire choices and technical development. Isolde commented that while her voice hadn't substantially changed, she felt her muscles had gotten weaker and she lost some of the "animal strength" she had in her 30s and 40s. She acknowledged that this could be attributed to becoming more sedentary during the "COVID pause", and she was working to build her strength through walking and yoga. This acknowledgement of the role core strength is perceived to play in singing dramatic repertoire was echoed by both Sieglinde and Grimmerde,



both of whom engage in cross training, running and weightlifting in order to build their core strength after significant illnesses that caused them to take a mid-career hiatus. Moreover, all of the singers were constantly working to refine their singing techniques, often with the help of trusted teachers and coaches, and used this to mitigate changes in the voice.

For the three post-menopausal singers who noticed changes in their singing and attributed them to hormonal changes, the results were surprising and differed from both the research cited above and the singers' own preconceptions of menopausal voice issues. Instead of losing notes from the top of their range or developing a wayward vibrato that might be attributed to a voice that sounds old, the singers' embodied experience was that specific notes in their middle range lost focus. Siegrune clearly explained:

It's just an area where, for some reason, the way the cords react in menopause, that note doesn't particularly [phonate] G sharp, A, and then it shifted a bit. Then A got stronger, and then the G sharp was a little bit weaker. And then we had to work on that as well, you know, but it was just, it was fascinating.

I acknowledge that when starting this research, I had the preconceived opinion that singers could lose their high notes as their voices aged and they went through menopausal hormonal transitions, and therefore I was surprised to hear this account of a singer losing focus in her middle voice. Siegrune was questioned as to which G sharp and A natural, thinking it must have been in the range of C5 to C6. Instead, Siegrune said these notes were in the middle of the treble stave between C4 and C5—the middle of the soprano voice. When the interviewer expressed this surprise, Siegrune took time to explain that she found an expert teacher when she was 49 who suggested she would need to pre-empt changes in the voice due to menopause. Siegrune was adamant she would not take HRT due to negative health impacts and that she had seen colleagues lose notes at the top of the voice and develop “a hole” in the middle of the voice with or without using HRT. Her new teacher suggested they would need to work on the middle of the voice as in his experience this was the area that caused female singers' difficulties during menopause. For Siegrune, this technical work has allowed her voice to meet the demands of a busy international singing career in dramatic soprano repertoire and

allowed her to mitigate issues in the middle voice that could destabilise her vocal registers and range.

Helmwige had similar preconceptions to the researcher:

I assumed that my top would start to go. My top has not started to go and in fact it has become stronger which is bizarre. And I'm you know, I'm monitoring every single day. There are different parts of my voice that I have to think about focusing. But so far, it has not been what I've expected ... at the moment, not only is everything holding but it's holding stronger than ever. It feels like it's higher, which is totally bizarre.

As professional colleagues who have worked on operas together, Helmwige and Siegrune had discussed their vocal changes with each other. Helmwige laughed when she recalled their similar vocal changes, noting that while Siegrune felt she had focus issues around G sharp and A natural on the stave, Helmwige started noticing focus issues at B flat:

Mine was the half note right above. Because I called her and I was like, "What the hell is happening?" And she was like, "Oh", and I was like "Oh thank you". Yeah. Yeah, we've worked together a lot actually.

These comments suggest that, like Sieglinde's recollections of dressing room conversations that contained important information for singers about hormonal changes affecting the female operatic voice, singers at an elite level engage in peer-to-peer sharing and education. This sharing between singers at an elite level also suggests a knowledge gap regarding how elite singers can manage these transitions. They also reflect that the research in voice sciences, which has focused on hormonal changes and the female speaking voice or amateur singing voice, may not be particularly relevant to singers at an elite level.

Sieglinde's experience echoed Helmwige and Siegrune in that it was the middle of her voice where she started to have issues. She also felt that she did not recognise this as menopause due both to the relatively early age she experienced it and the lack of knowledge about the effect menopause would have on her professional singing voice:

The middle of my voice was really foggy. ... I didn't know that it was the menopause. Because it seemed to be very early. I thought, Oh, I've got some sort of allergy thing where the middle of my voice is really funny.

Without realising these issues were related to the menopause, Sieglinde acknowledged that she probably pushed the middle of her voice for

some time, which then had an effect on other parts of her voice. She worked to mitigate these focus-issues with her teacher by using “a lot of croak” to get her cords to “meet better”.

Sieglinde’s further comments also reflect any potential preconceptions about losing the top of the voice:

I think the top of my voice is as good as it ever was, you know, I know that you’re supposed to lose something from the top but it may be that technically I’m more aware so that actually I feel more comfortable. And I’m talking about, so like about a [high]C[6] because I was never really comfortable on Cs anyway. So now I feel like they’re more reliable than they ever were.

This quote from Sieglinde reflects a sentiment that was common to all the singers interviewed: that changes to the vocal mechanism due to hormonal fluctuations, ageing, illness and beyond, might be unavoidable, but at an elite, professional level are often mitigated by technical awareness and a willingness to continue to refine technique throughout their careers.

## CONCLUSION

These accounts from elite, professional singers establish an awareness that hormonal changes and ageing can significantly affect voices and careers, even though a woman’s individual experiences of hormonal change are, to some degree, unique. For those that have suffered negative effects ascribed to hormonal changes, their mitigation strategies have enabled them to continue professional operatic careers at an elite level. Moreover, in the case of vocal changes in perimenopause and menopause, singers who reported changes were surprised that their personal experiences did not follow their preconceived assumptions either informed by their knowledge of the research or negative commentary about ageing female voices they had heard anecdotally during their time in the opera industry.

This suggests that the results of clinical studies on the speaking voice/non-professional singing voice may not be relevant to elite professional opera singers who have spent their careers developing strategies to optimise vocal performance. It also suggests that changes in the middle of the voice, as opposed to the top of the voice, might be more obvious to dramatic sopranos given the tessitura and range of dramatic soprano roles compared to other soprano voice-types. These interviews highlight the importance of further research and the need for personalised

and individualised vocal training and care for female singers experiencing these changes from vocal coaches, healthcare professionals and the industry.

By acknowledging and addressing the unique changes in their voices, it is apparent that female singers can continue to thrive and grow in their vocal abilities throughout their careers. Research and education are also important for opera industry professionals as a means to counter misogynist perceptions and to break down stigma about the effect of hormonal changes on the female voice that benefit neither individual singers nor the broader opera industry. This type of qualitative “insider” research—which inspired candour from professional opera singers—has the potential to break down stigmas in the industry, benefitting professionals of all voice-types, both male and female, as Helmwig neatly summarised:

We are elite athletes. And if we do this for the long haul, we get sick and sometimes we do things in a way that we have been pushed to do because of the proximity of performing ... there’s no way around this, you have to sing ... and there is a stigma around needing a doctor sometimes to be able to get us to do what we do.

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## BIOGRAPHY

**Katrina Waters** is a Mezzo Soprano currently undertaking a PhD in creative practice at the ANU School of Music titled "Building Brünnhilde: an investigation into the mid-career transitions of female dramatic voices". Her research to devise a theatrical song cycle for female dramatic voice with Australian female composers, titled "Songs for Loud Women", has been awarded the 2023 ABC Top 5 Arts Media Residency and the 2022 Early Phase Residency @ The Street Theatre.

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<sup>1</sup> These interviews formed part of my PhD study titled "Building Brünnhilde: an investigation into the mid-career transitions of female dramatic voices". The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee (Protocol 2021/530).

**APPENDIX 1: PARTICIPANT DATA**

<b>Name</b>	<b>Age</b>	<b>Hormonal Life Stage</b>	<b>Children</b>	<b>Still performing</b>
Orlinde	40- 45	Perimenopause Contraception to avoid menstruation	No	Yes
Grimgerde	46 - 50	Perimenopause Menstruating	No	Yes
Senta	46 - 50	Perimenopause Menstruating	No Tried IVF	Yes
Sieglinde	46 - 50	Post-Menopause - early due to illness	Yes	Yes
Waltraute	46 - 50	Perimenopause Menstruating	No Tried IVF	Yes
Elsa	46 - 50	Perimenopause Hysterectomy	No	No
Roßweise	51 - 55	Perimenopause HRT Thyroid medication	Yes	Yes
Helmwige	51 - 55	Post- menopause -Blood test confirm Hysterectomy	Yes	Yes
Schweleite	56 - 60	Post-menopause	No	Yes
Isolde	56 - 60	Post-menopause	No	Yes
Gerhilde	56 - 60	Post-menopause	No	Yes
Ortrud	60+	Post-menopause	No	No
Siegrune	60+	Post-menopause Thyroid medication	No	No