This important study by Ha and colleagues explores the sociodemographic trends and perinatal outcomes of fathers aged 50 years and older in the United States with children born from 2011 to 2022. Using data from the National Vital Statistics System, Ha et al extract data from more than 46 million US live births that occurred during this period. Ha et al found that the number of births to fathers aged 50 years and older has significantly increased over the past decade. Fathers aged 50 years or older now comprise 1.3% of all US fathers, which increased from 1.1% just 10 years earlier. Advanced paternal age was associated with higher risks of adverse perinatal outcomes, including preterm birth and low birth weight, even after adjusting for maternal factors. The use of assisted reproductive technology (ART) was notably higher among older fathers, with significant reliance on such technologies as paternal age increased. Furthermore, fathers aged 70 years or older sired more female than male offspring, which contrasts with overall higher birth rates of males vs females in the general population. These findings highlight the evolving trend of delayed fatherhood and its implications for family planning and public health, underscoring the need for targeted education and counseling for older prospective fathers.

Menopause places a biologic limit on the age of a mother. Beginning at approximately age 35 to 38 years, the number and quality of a woman’s ovum drastically decline. While there is technically no fatherhood age limit, emerging evidence paints a similar picture regarding declining sperm number and quality as males age. This aging phenomenon is restricted to the human species, since sperm quality tends not to decline over other species’ lifetimes. Age-related declines in ejaculate quality include decreases in semen volume, sperm motility and morphology, and increases in DNA fragmentation, sperm aneuploidy, and epigenetic changes. Both the American Urological Association and the American Society of Reproductive Medicine recommend counseling older fathers that these changes may increase the risk of autism, pediatric cancers, need for ART, and perinatal complications in offspring. The lattermost issues are substantiated by this study by Ha et al. Thus, for the general practitioner encountering older prospective fathers, we recommend prompt referral to a specialist in male reproductive medicine and surgery (MRMS) for proper evaluation and counseling.

The MRMS specialist plays a critical role in evaluating and treating male factor infertility. Complementing the basic semen analysis, which provides information on sperm concentration and motility, there now exists an increasing number of advanced sperm quality tests that assess sperm function. A mail-in test can assess sperm capacitation (the final stage of functional sperm maturation and a prerequisite to fertilization) and calculate the probability of generating a pregnancy. These findings can help guide male patients in continuing attempts via natural conception vs perhaps moving more rapidly toward ART. Another at-home mail-in test can assess sperm methylation (epigenetic) patterns and calculate the likelihood of success with intrauterine insemination. These findings can help guide male patients in choosing between intrauterine insemination or moving forward with in vitro fertilization. Additionally, another assay assesses protein expression patterns of an ejaculate that correlate to functionally optimal fertility states. These findings can help assess fertility potential, monitor treatments, and provide information on optimal times when fertility potential is elevated during intrauterine insemination or in vitro fertilization procedures. Especially for the aging male with declining sperm health, the role of the MRMS specialist also includes optimizing sperm quality through hormonal management or microscopic surgical correction of varicoceles, which can overheat the testes and impair sperm function. Sperm extraction services,
such as microsurgical testicular sperm extraction for men with nonobstructive azoospermia (no sperm in the ejaculate), as well as vasectomy reversal offer additional options for men to father children. As fathers in the US are getting older, expert evaluation and management becomes even more critical and timely.

Findings from this study by Ha et al1 raise many important unanswered questions. Longitudinal studies of offspring health could help researchers understand the pathophysiologic impact of older paternal age on various health conditions, such as psychiatric disorders, congenital anomalies, and developmental milestones. Advanced genetic and epigenetic analyses of sperm from older fathers could reveal novel patterns of and mechanisms by which sperm quality degrades with age and impacts the developing fetus. Controlled prospective trials may reveal whether ART mitigates the risks of advanced paternal age in reproductive outcomes. Finally, epidemiologic studies could help elucidate how socioeconomic and cultural factors impact delayed fatherhood and its effect on family dynamics and child upbringing. Understanding these factors could help in developing targeted public health interventions to better educate older fathers and their families.

ARTICLE INFORMATION
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