

IN THE COURT OF APPEALS OF THE
STATE OF OREGON

STATE OF OREGON,
Plaintiff-Respondent,

v.

JAMES ANTHONY TRUJILLO,
Defendant-Appellant.

Multnomah County Circuit Court
120850169; A153218

John A. Wittmayer, Judge.

Submitted September 30, 2014.

Peter Gartlan, Chief Defender, and Alice Newlin-Cushing, Deputy Public Defender, Office of Public Defense Services, filed the brief for appellant.

Ellen F. Rosenblum, Attorney General, Anna M. Joyce, Solicitor General, and Joanna L. Jenkins, Assistant Attorney General, filed the brief for respondent.

Before Ortega, Presiding Judge, and DeVore, Judge, and Garrett, Judge.

DEVORE, J.

Affirmed.

DEVORE, J.

Defendant appeals a judgment of conviction for driving under the influence of intoxicants (DUII), ORS 813.010(1), and reckless driving, ORS 811.140. We reject, without further discussion, defendant's first and second assignments of error in which he challenges the trial court's denial of his motion for a judgment of acquittal.¹ In his third assignment of error, defendant challenges the admission of an expert's testimony regarding retrograde extrapolation to determine blood-alcohol content (BAC) at the time of driving.² He contends that retrograde extrapolation should be inadmissible because it is not scientifically reliable and that, even if the evidence might be admissible in some cases, the state did not establish an adequate foundation for use of the evidence. "We review rulings as to whether evidence is scientific and whether it is admissible as such for errors of law." *State v. Ohotto*, 261 Or App 70, 71, 323 P3d 306 (2014). We review the facts underlying the admissibility of scientific evidence *de novo*. *State v. Branch*, 243 Or App 309, 314, 259 P3d 103, *rev den*, 351 Or 216 (2011). We affirm.

I. BACKGROUND

The facts are undisputed. At around 9:00 a.m. on August 26, 2012, a security officer noticed defendant wandering around a Portland SmartPark garage. Between 9:50 and 10:00 a.m., a garage employee saw defendant on foot, and, soon thereafter, he saw defendant's red car come down the ramp, pull up to the exit gate arm, pause for a few seconds, and quickly reverse back up the ramp in the wrong direction. Defendant's car smashed into an unused pay booth.³ Defendant turned his car around and drove up into

¹ Defendant's fourth, fifth, and sixth assignments of error are moot in light of the corrected judgment entered in the trial court that removed the unitary assessments under *former* ORS 137.290 (2011).

² Retrograde extrapolation refers to "the mathematical process of plotting backwards [an individual's] BAC on a BAC curve" after the individual has consumed alcohol. *State v. Baucum*, 268 Or App 649, 661, 343 P3d 235 (2015); *see also* Mark R. Montgomery and Mark J. Reasor, *Retrograde Extrapolation of Blood Alcohol Data: An Applied Approach*, 36 *Journal of Toxicology and Environmental Health* 281, 286-87 (1992).

³ The impact of the crash caused the booth to damage a vehicle parked behind it.

the garage. When the police and security officers searched the garage, defendant was nowhere to be found.

Later that day, the security officer saw defendant walking outside the garage. The security officer summoned Officer Payton. Payton noticed that defendant was slightly swaying, smelled of alcohol, and had watery, bloodshot eyes. Defendant told Payton that he had backed into the pay booth, he had seen someone running after his car, he had not stopped, he had assumed that the police were called, and he had walked down the garage stairs to calm down.

Payton arrested defendant and took him to the police station, where he failed four of six field sobriety tests. Defendant said that he had had “four or five [drinks] at the bar” but had stopped drinking at 2 a.m. that morning. About two and one-half hours after the garage incident, an Intoxilyzer test at 12:36 p.m. revealed defendant’s BAC to be 0.06 percent. Defendant was charged with one count of DUII, three counts of failure to perform duties of a driver when property is damaged, and one count of reckless driving.⁴

At trial, the state sought to offer the testimony of a forensic scientist from the Oregon State Police Crime Lab, relating to defendant’s intoxication. During an evidentiary hearing under OEC 104, the expert, Bessett, described his training in the field, his college degree in biology, his professional training programs, and twelve years of professional experience working in toxicology. ORS 40.030(1) (OEC 104) (preliminary questions concerning the qualification of a person to be a witness).

Bessett testified that in order to perform a “retrograde extrapolation”—to “estimate a person’s BAC at a previous time”—he needed a time of the breath or blood test, a time that the drinking began, and a time of the “incident or the time of where you want the retrograde extrapolation to be.”⁵ He explained that retrograde extrapolation should be given as “a range,” because the unrealistic certainty of

⁴ Defendant later prevailed on a motion for a judgment of acquittal on one count of failure to perform the duties of a driver and was acquitted of another.

⁵ Bessett noted that a retrograde extrapolation also requires a breath test result exceeding a 0.02 BAC because “top experts say *** a person can hover at .01, .02 for several hours.”

a “specific point” would risk an incorrect result or a high failure rate. When asked whether the technique of retrograde extrapolation is accepted in forensic science, Bessett testified:

“Yes. As long as the person is qualified, trained and the person does not give the retrograde extrapolation to an exact result, meaning that I cannot say with a 100 percent certainty that somebody who blew a .06, let’s say, at 3:00 a.m., that they were—they had to be a .15 at 9:00 p.m. That’s unscientific because there’s a lot of variables.

“Each person is different. People’s livers work at different rates. A person’s liver even works at different rates on different evenings. So *** what is known *** through the peer-reviewed published studies is that the liver works in a range, meaning most, almost all people, drinkers that is, will eliminate alcohol between a .01 percent per hour and a .025 percent per hour.

“[T]hese are normal drinkers, not children, and these are not people with excessively high BACs, let’s say of a .3, .4, .5 or higher. People who reach that amount, that high of a BAC, are probably two things, chronic alcoholics or that they binge drink, and when *** you reach that high of a BAC your liver can work much faster than that .025 range, can be at .03, .04, .05.

“So I used a .01 to .025 for the majority or vast majority of people except for those excessively high BACs or chronic alcoholics that are up there quite often.”

When asked whether the analysis has a high failure rate, Bessett explained,

“If a person has enough information and gives a range, *** I can be really confident that the person fits somewhere in that range based on peer-reviewed published material.

“I try to limit the error by giving a large range and factoring in as much as I can and having known values.”

Bessett reiterated that “people absorb alcohol differently,” resulting in a range of possible BAC values that could have existed “back in time.”

Bessett discussed how the Widmark formula is used in performing retrograde extrapolation. That formula applies a mathematical equation using the “extrapolation time” and the time of the breath test. Certain variables such as the last time the person drank alcohol are significant. And, no drinking should have occurred after the traffic stop or incident. Bessett described how an estimate can be deduced about the number of drinks a person had consumed, “plus or minus 20 percent” due to individual variables. He testified that the formula is generally accepted in his field.

Defendant asserted that the retrograde extrapolation evidence should not be admitted at trial. He contended that Bessett “has not met the *Brown /O’Key* standards.” *State v. Brown*, 297 Or 404, 687 P2d 751 (1984); *State v. O’Key*, 321 Or 285, 899 P2d 663 (1995). He argued that the proper foundation for validity of scientific evidence had not been established and that a number of the *Brown* and *O’Key* factors did not weigh in favor of the evidence’s admissibility. After considering those factors, the trial court overruled the objection and determined that Bessett could testify about retrograde extrapolation.

At trial, Bessett began by testifying about alcohol absorption and elimination rates. Because “peer-reviewed published studies” demonstrate that most people’s livers eliminate alcohol within a range of 0.01 to 0.025 percent per hour, Bessett said that he uses that range when making a retrograde extrapolation. It is a range that covers “the vast majority of people.” He testified that a person in defendant’s situation would have had a BAC of “at least a .08” at the point at which defendant was driving. That is the low end of a range that would be between a 0.08 and 0.11 BAC, given the variables that could alter the outcome of the analysis. The trial court admitted a copy of Bessett’s calculations into evidence. The jury ultimately found defendant guilty of driving under the influence, failure to perform the duties of a driver, and reckless driving.

On appeal, defendant reiterates that retrograde extrapolation should be inadmissible under OEC 702 and that the state failed to establish an adequate foundation

in this case.⁶ *Brown*, 297 Or at 404; *O'Key*, 321 Or at 285; OEC 702. In defendant's view, Bessett's testimony about retrograde extrapolation did not possess sufficient indicia of scientific reliability. The state responds that the foundation established at trial was sufficient and the method used by the expert for making retrograde extrapolation met the requirements under *Brown* and *O'Key*.⁷ Because defendant did not make any objections to the evidence during Bessett's testimony at trial, we are limited to the objection raised at the OEC 104 hearing. *State v. Perry*, 347 Or 110, 116-17, 218 P3d 95 (2009) ("A general ruling that a certain type of evidence (even scientific evidence) is minimally relevant under OEC 401 and OEC 702 does not relieve a party of the obligation to make specific objections to discrete pieces of that evidence at trial, if the dynamics of the trial process reveal other grounds for objection.").

II. *BROWN/O'KEY* AND RETROGRADE EXTRAPOLATION

"Before applying the test for admissibility of scientific evidence, we must determine for what purpose the evidence is offered." *State v. Sampson*, 167 Or App 489, 499, 6 P3d 543, *rev den*, 331 Or 361 (2000) (citing *O'Key*, 321 Or at 307). Under ORS 813.010,

"(1) A person commits the offense of driving while under the influence of intoxicants if the person drives a vehicle while the person:

"(a) Has 0.08 percent or more by weight of alcohol in the blood of the person as shown by chemical analysis of the breath or blood of the person made under ORS 813.100 [implied consent to breath or blood test], 813.140 [chemical

⁶ Under *Brown* and *O'Key*, admissible scientific evidence must be relevant under OEC 401, helpful to the trier of fact under OEC 702, and not subject to exclusion under OEC 403. *State v. Perry*, 347 Or 110, 121, 218 P3d 95 (2009). Although defendant argues on appeal that, under OEC 403, the probative value of the evidence is outweighed by unfair prejudice, he did not present that argument to the trial court. Accordingly, that argument is not preserved, and we do not address it on appeal.

⁷ The state contends that the evidence is not "scientific." We reject that argument without further discussion. *State v. Whitmore*, 257 Or App 664, 672, 307 P3d 552 (2013) (retrograde extrapolation is scientific evidence); *Ohotto*, 261 Or App at 76 (an expert is required to testify to retrograde extrapolation under OEC 702).

test with consent] or 813.150 [chemical test at request of arrested person];

“(b) Is under the influence of intoxicating liquor, a controlled substance or an inhalant; or

“(c) Is under the influence of any combination of intoxicating liquor, an inhalant and a controlled substance.”

Accordingly, the state offered Bessett’s testimony in this case for the purpose of establishing that defendant’s blood-alcohol content exceeded the threshold provided in ORS 813.010(1)(a).

Generally, there are three fundamental requirements for expert testimony: (1) the witness’s qualification as an expert, (2) helpfulness of the expert’s testimony, and (3) an adequate foundation for the testimony.⁸ *O’Key*, 321 Or at 291 (quoting Christopher B. Mueller & Laird C. Kirkpatrick, *Modern Evidence* § 7.8, 990 (1995)). When the evidence is scientific, the trial court must also ensure that the expert’s testimony is “supported by the appropriate scientific validation” and that “the persuasive appeal [of the evidence] is legitimate.” *Id.* at 291, 292. That is because “[e]vidence perceived by lay jurors to be scientific in nature possesses an unusually high degree of persuasive power.” *Id.* at 291. Therefore, the proponent of the evidence must demonstrate that an expert’s scientific testimony is based upon “scientifically valid principles” and is “pertinent to the issue to which it is directed.” *Id.* at 303; *State v. Reed*, 268 Or App 734, 738, 343 P3d 680 (2015).

The Supreme Court has supplied several factors to aid a trial court’s determination of whether scientific evidence is valid under OEC 702. Those factors include:

- “(1) The technique’s general acceptance in the field;
- “(2) The expert’s qualification and stature;
- “(3) The use which has been made of the technique;

⁸ OEC 702 provides:

“If scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education may testify thereto in the form of an opinion or otherwise.”

- “(4) The potential rate of error;
- “(5) The existence of specialized literature;
- “(6) The novelty of the invention; and
- “(7) The extent to which the technique relies on the subjective interpretation of the expert.”

O’Key, 321 Or at 299. Those factors, read together, do not constitute an exhaustive list of considerations or a mechanical checklist. *Id.* at 300; *Brown*, 297 Or at 417.

Defendant’s appeal presents the question whether retrograde extrapolation—the mathematical process of plotting backwards an individual’s BAC using the Widmark formula—is scientifically valid. The record shows that retrograde extrapolation is dependent on two factors: (1) the body’s peak absorption of alcohol, and (2) the body’s elimination rate of alcohol from the blood. Defendant does not make challenges specific to either factor. Instead, he objects more generally to the admissibility of retrograde extrapolation as scientific evidence. *See Sampson*, 167 Or App at 493 (emphasizing that the defendant did not challenge individual components of DRE protocol “but, rather, present[ed] only the question of whether the DRE protocol is, in general, admissible” (italics omitted)).⁹ Because other questions are not raised on appeal, we do not address whether experts must consider particular, individualized variables in determining peak absorption and elimination in calculating BAC through retrograde extrapolation. We do address, however, the application of the *Brown/O’Key* factors to admission of evidence of retrograde extrapolation. Although we recently addressed some of the factors in *State v. Baucum*, 268 Or App 649, 343 P3d 235 (2015), the discussion was limited

⁹ We note that jurisdictions have come to different conclusions regarding admissibility requirements for peak absorption and elimination determinations involved in retrograde extrapolation. For instance, some jurisdictions require an expert to demonstrate knowledge of whether the defendant’s body was absorbing or eliminating alcohol at the time of a blood-alcohol test, sufficiently consider the eating and drinking history of a defendant in establishing peak absorption, or demonstrate where on a BAC curve a defendant’s BAC falls, in order for retrograde extrapolation evidence to be deemed reliable. *Compare State v. Armstrong*, 267 P3d 777, 782-83 (Nev 2011); *Mata v. State*, 46 SW3d 902, 916 (Tex Crim App 2001) *with State ex rel. Montgomery v. Miller*, 234 Ariz 289, 304, 321 P3d 454 (Ariz Ct App 2014).

to the particular factors that were challenged. Addressing more factors, we conclude that, as presented in this case, retrograde extrapolation is generally admissible scientific evidence under the *Brown/O'Key* analysis for the purposes of OEC 702.

A. *General acceptance in the field*

In *Baucum*, we rejected the defendant's contention that an expert's testimony regarding retrograde extrapolation is inadmissible scientific evidence or "junk science" that is not generally accepted in the relevant scientific community." 268 Or App at 656-57. We concluded that retrograde extrapolation is generally accepted in the relevant scientific community and courts of other jurisdictions. We observed that "[a] review of treatises and literature on retrograde extrapolation indicates that it is used not only to test blood alcohol concentrations, but in disciplines such as pharmacology to determine correct drug dosages for individuals." *Id.* at 659 (citing Mark R. Montgomery and Mark J. Reasor, *Retrograde Extrapolation of Blood Alcohol Data: An Applied Approach*, 36 *Journal of Toxicology and Environmental Health* 281, 283 (1992)).

In surveying other jurisdictions' case law, we also observed "general acceptance of retrograde extrapolation, so long as the expert has sufficient information to determine where on the BAC curve—in the absorption phase, at the peak, or in the elimination phase—the defendant was at the time of the stop and at the time of the blood, urine, or breath test." *Id.* We need not reiterate our observations nor reexamine that conclusion in *Baucum*. General acceptance in the field weighs in favor of admissibility.

B. *Expert's qualifications and stature*

Although contested before the trial court, defendant does not challenge Bessett's qualifications on appeal. We agree with defendant's concession that, given Bessett's testimony regarding his educational background, professional experience, and training, he is qualified to give expert testimony on retrograde extrapolation. *O'Key*, 321 Or at 317 (suggesting training is sufficient for this factor, provided the expert has learned how to "administer the test and

accurately record the test results”); *Sampson*, 167 Or App at 503 (observing, in the context of the DRE protocol, that “[t]he reliability of the *** results depends on the ability of the officer who administers it”).

C. *Use of technique*

As this court has previously noted, “there are two potentially pertinent considerations under [the “use”] factor—‘how widely the protocol has been used’ and ‘the goal of the protocol.’” *Reed*, 268 Or App at 743 (quoting *Sampson*, 167 Or App at 504). Use includes “non-judicial uses and experience” of retrograde extrapolation and the Widmark formula. *O’Key*, 321 Or at 317 (considering non-judicial uses and experiences with the process or technique as a factor). Generally, expert testimony based solely on preparation for litigation-related use is deemed less reliable than independent research conducted for other scientific purposes. See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F3d 1311, 1317 (9th Cir), *cert den*, 516 US 869 (1995). An exception may include processes used in forensic science such as “[f]ingerprint analysis, voice recognition, DNA, *** and a variety of other endeavors closely tied to law enforcement [that] may indeed have the courtroom as a principle theatre of operations.” *Id.* at 1317 n 5.

Defendant concedes that retrograde extrapolation has been widespread in blood-alcohol analysis for quite some time. Although the record reflects that retrograde extrapolation is performed primarily to establish a person’s BAC for DUII prosecution, retrograde extrapolation is also pertinent to other alcohol-related litigation, as well as other disciplines such as pharmacology. *Baucum*, 268 Or App at 659. Further, “the theory and methodology of retrograde extrapolation has undergone a great deal of testing and study outside the courtroom.” *State ex rel. Montgomery v. Miller*, 234 Ariz 289, 300, 321 P3d 454, (Ariz Ct App 2014). We consider the use made of the technique to favor admissibility.

D. *Operational standards and potential rate of error.*

In considering this factor, “[w]e focus on whether proffered scientific evidence has a rate of error low enough that its results can be trusted with ‘reasonable certainty.’”

Sampson, 167 Or App at 505 (quoting *State v. Lyons*, 324 Or 256, 275, 924 P2d 802 (1996)). We are mindful that “the *Brown/O’Key* test does not require proof of scientific infallibility ***.” *Sampson*, 167 Or App at 507.

Bessett described the factors that make up a retrograde extrapolation and the variables that can affect an analysis. He explained that retrograde extrapolation is accepted in his field, so long as “the person does not give the retrograde extrapolation to an exact result[.]” That is because the “liver works in a range, meaning most, almost all people, drinkers that is, will eliminate alcohol between a .01 percent per hour and a .025 percent per hour.” He explained that absorption rates vary and account for a range of possible values in a retrograde extrapolation analysis. Given the number of variables that could affect a retrograde extrapolation, Bessett explained that it is important to provide a range, rather than a precise value of BAC, and that, in doing his calculations, he attempts to minimize error by giving a large range and factoring in as much as he can about known variables.

Bessett’s testimony is consistent with studies indicating that there is a wide but consistent range of rates within which alcohol is eliminated from a person’s blood. See *Baucum*, 268 Or App at 661 n 12; see also, [*State v. Eumana-Moranchel*](#), 352 Or 1, 9, 277 P3d 549 (2012) (expert used 0.01 to 0.025 as range of alcohol elimination rate). Rates of elimination, as Bessett testified, are dependent on several variables, including whether a person frequently engages in “binge” drinking. As the United States Supreme Court recently observed, “[m]ore precise calculations of the rate at which alcohol dissipates depend on various individual characteristics *** and the circumstances in which the alcohol was consumed.” *Missouri v. McNeely*, ___ US ___, ___, 133 S Ct 1552, 1560, 185 L Ed 2d 696 (2013). Many peer-reviewed studies address “the factors that affect the rate of alcohol absorption and the rate of elimination, and indicate that there are certain variables that consistently affect those rates, and predictable patterns on the BAC curve.” *Baucum*, 268 Or App at 661. Those studies suggest predictability in the body’s absorption and elimination of alcohol, within a range of rates. *Id.* at 661 n 12 (citing studies demonstrating experts’ use of a range of elimination rates).

Bessett's testimony, although less developed about the variability of the body's absorption of alcohol, is also consistent with studies noted in *Baucum* demonstrating that "the speed of a person's peak absorption is dependent on variables such as the presence and type of food in the stomach, the person's gender, the person's weight, the person's age, the person's mental state, the drinking pattern, the type of beverage consumed, the amount consumed, and the time period of alcohol consumption." *Id.* at 662 (internal quotation marks and emphasis omitted).

Retrograde extrapolation using the Widmark formula does not result in a precise BAC value, because experts use a range of rates to account for variation among individuals' rates of absorption and elimination. However, the elimination rates used to make the calculation, here 0.01 to 0.025, result in a range of possible BAC values in which a defendant's BAC is very likely to fall. Using a range that accounts for variability thereby serves as a check against a high rate of error. Bessett conformed to this practice and considered evidence of the time of the "incident" and had knowledge that no drinking had occurred after that incident while defendant was in custody. We conclude that operational standards favor admissibility.

E. *Existence of specialized literature and peer review*

As we noted in *Baucum*, there are many studies pertaining to factors affecting "the rate of alcohol absorption and the rate of elimination" and addressing the application of the Widmark formula to make retrograde extrapolation. *Id.* at 661. Bessett testified that his knowledge was based on "peer-reviewed" studies, and he described attending conferences in which experts in the field of breath alcohol presented on the topic, including experts discussing Widmark's research. He indicated that he is confident in assessing whether a person "fits somewhere in [a] range based on peer-reviewed published material."

Defendant acknowledges the existence of those studies, but he argues that they indicate a "lack of acceptance in the scientific community." The studies cited by defendant, however, do not indicate that making retrograde extrapolation has been rejected or that peer-reviewed

articles have discredited the underlying scientific theory of the evidence—that is, the Widmark formula. See *Lyons*, 324 Or at 275; *Sampson*, 167 Or App at 508; *Reed*, 268 Or App at 744-45. In other words, “[t]he difficulty with defendant’s argument is that it attacks the credibility of the literature bolstering the reliability of [the scientific evidence], not its existence.” *Sampson*, 167 Or App at 508. The existence of specialized literature and peer review weighs in favor of admissibility.

F. *Novelty*

“Although novelty is a factor to be considered, it does not ‘imply invalidity.’” *Reed*, 268 Or App at 745 (quoting *O’Key*, 321 Or at 302 n 21). Defendant challenged the novelty of retrograde extrapolation at trial but no longer does so on appeal. We note that the Swedish chemist, Widmark, published research in 1932 regarding the use of retrograde extrapolation and that research is still widely cited in forensic science in connection with forensic alcohol analysis. See, e.g., R. Andreasson and A. W. Jones, *The Life and Work of Erik M. P. Widmark*, 17 *American Journal Forensic Med Pathology* 177-90 (1996). The relative familiarity of the methodology weighs in favor of the admission of retrograde extrapolation using the Widmark formula.

G. *Extent to which technique relies on expert’s subjective interpretation*

Defendant argues that retrograde extrapolation relies on a subjective interpretation by the expert calculating a defendant’s BAC. In support of that argument, defendant contends that Bessett’s testimony indicated that experts may choose different ranges of elimination rate variables, here 0.01 to 0.025, and experts may vary with regard to which variables they believe are sufficient to calculate an accurate range of BAC values.¹⁰

The parties do not dispute that conducting retrograde extrapolation requires some degree of subjective evaluation in addressing the variables that will likely affect

¹⁰ Defendant also argues that experts may use other formulas to make retrograde extrapolation. We do not address the scientific admissibility of other methods of retrograde analysis under OEC 702.

the range of possible results. Nevertheless, conducting retrograde analysis in this case relied on the application of the Widmark formula, a mathematical formula that is not itself subject to an expert's subjective revision. Bessett testified that, once necessary variables are known, an expert can insert the variables into the equation, as in algebra, to produce a range of possible results. To that extent, the evidence is verifiable and can be replicated by other experts in the field, including an expert retained by a defendant who may re-examine the evidence. *See O'Key*, 321 Or at 318. Therefore, retrograde extrapolation mainly involves objective application of a formula and does not require subjective interpretation. We conclude that the relative degree of subjectivity and the transparency of the calculation favor admissibility.

In light of our conclusions as to these factors, we held that retrograde extrapolation evidence is admissible under OEC 702 with a qualified expert.

III. ADMISSIBILITY OF TESTIMONY

An expert may meet the requirements of OEC 702 by explaining “his or her own expertise, how he or she gathers and uses particular information, how that information informs his or her conclusions, and the scientific basis for the steps that he or she takes in that process.” *State v. Sanchez-Alfonso*, 352 Or 790, 804, 293 P3d 1011 (2012). Defendant asserts that Bessett's testimony and his particular application of retrograde extrapolation do not meet the requirements of OEC 702, because his range of elimination rates was unreliable.¹¹ *See Baucum*, 268 Or App at 665 (addressing similar argument). Because, however, Bessett's range of elimination rates was explained

¹¹ Although Bessett offered testimony about alcohol absorption at trial, defendant did not object to the testimony and does not otherwise raise a challenge on appeal to the scientific reliability of Bessett's testimony as to peak absorption. We note that although the time needed to reach peak BAC is variable, defendant admitted that he had stopped drinking at 2:00 a.m. and several hours had already passed by the time his BAC was recorded during the breath test. As some scientific research indicates, peak absorption occurs within 75 minutes from the time an individual stops drinking, for 92 percent of individuals. *Baucum*, 268 Or App at 662 n 14 (citing A. W. Jones, K. A. Jonsson, A. Neri, *Peak Blood-Ethanol Concentration and the Time of Its Occurrence After Rapid Drinking on an Empty Stomach*, 36 *Journal of Forensic Sciences* 376, 378-79 (1991)).

and was employed as a range so as to make his opinion more reliable, we disagree.

In this case, Bessett testified to (1) his knowledge and experience performing retrograde extrapolation; (2) the basis of his knowledge, including his familiarity with peer-reviewed studies and his training; (3) his consideration of variables that affect alcohol elimination from the body; (4) the information he considered highly significant to conducting retrograde extrapolation; and (5) his reasoning in applying that evidence to the Widmark calculation. In light of that evidence, Bessett's testimony regarding making a retrograde extrapolation in this case meets the admissibility requirements of OEC 702.

Our consideration of the *Brown/O'Key* factors leads us to conclude generally that retrograde extrapolation using the Widmark formula is scientifically valid. The foundation provided in this case was sufficient to meet the admissibility requirements of OEC 702. The trial court did not err in concluding that Bessett's testimony was admissible.

Affirmed.