



SI vs Conventional Units Quiz

by Laura King, MA, ELS

Directions: In the United States, most physicians and other health care professionals use conventional units for most commonly encountered clinical measurements (eg, blood pressure), and most clinical laboratories report many laboratory values in conventional units. To serve these readers, but also to serve the needs of readers in countries where SI units are used, the [AMA Manual of Style](#) has adopted an approach for reporting units of measure that includes a combination of SI units and conventional units. Edit the following sentences based on your understanding of [section 18.5](#) of the [AMA Manual of Style](#).

1. One sealed, unopened, unexpired bottle of each of the 6 contact lens solutions was maintained at room temperature (73.4°F), and a second sealed, unopened, unexpired bottle was maintained in a water bath at 140°F for 4 weeks and then allowed to return to room temperature for 1 day.

ANSWER:

1. One sealed, unopened, unexpired bottle of each of the 6 contact lens solutions was maintained at room temperature (23.0°C), and a second sealed, unopened, unexpired bottle was maintained in a water bath at 60°C for 4 weeks and then allowed to return to room temperature for 1 day.

Editor's Note: The base SI unit for temperature is the kelvin, which has little application in medicine. Temperature values generally are reported in degrees Celsius, and values given in degrees Fahrenheit (°F) are converted to degrees Celsius (°C) with the following formula: $(^{\circ}\text{F} - 32)(0.556) = ^{\circ}\text{C}$ ([§18.5.2](#), Temperature, p 795 in print).

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2. The mean 2-dimensional area of the largest metastasis was 7.2 sq in.

ANSWER:

The mean 2-dimensional area of the largest metastasis was 46.8 cm².

Editor's Note: Measurements of length, area, volume, and mass are reported in metric units rather than English units. To convert square inches to square centimeters, multiply by 6.5 ([§18.5.1](#), Length, Area, Volume, Mass, pp 794-795 in print).

3. Of the dermatologists surveyed, 43% reported that their practices were within 100 miles of their residency training site, although there was substantial variation (mean, 538 miles; median, 189 miles).

ANSWER:

Of the dermatologists surveyed, 43% reported that their practices were within 100 miles of their residency training site, although there was substantial variation (mean, 538 miles; median, 189 miles).

Editor's Note: This sentence is correct as is. Although measurements of length, area, volume, and mass are reported in metric units rather than English units, in less formal, nonscientific texts, use of nonmetric units, such as miles or inches, is acceptable. In addition, if the nonmetric unit was used as part of a survey or questionnaire, the original measure should be retained ([§18.5.1](#), Length, Area, Volume, Mass, pp 794-795 in print).

4. Admission laboratory tests revealed the following: serum creatinine, 0.9 mg/dL; serum urea nitrogen, 11 mg/dL; serum albumin, 39 g/L; and prothrombin time, 11.5 seconds.

ANSWER:

Admission laboratory tests revealed the following: serum creatinine, 0.9 mg/dL (to convert to micromoles per liter, multiply by 88.4); serum urea nitrogen, 11 mg/dL (to convert to millimoles per liter, multiply by 0.357); serum albumin, 3.9 g/dL (to convert to grams per liter, multiply by 10); and prothrombin time, 11.5 seconds.

Editor's Note: For laboratory values, factors for converting conventional units to SI units should be provided in the article. In text, the conversion factor should be given once, at first mention of the laboratory value, in parentheses following the conventional unit ([§18.5.10](#), Laboratory Values, pp 797-816 in print). Although



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the *AMA Manual of Style* recommends writing out units of measure when no numbers are reported (eg, micromoles per liter), some journals may prefer to use abbreviations when listing SI conversion factors (eg, $\mu\text{mol/L}$).

5. Transscleral stereotactic radiation dosing of porcine eyes results in no apparent clinical abnormalities at doses less than 2400 rad.

ANSWER:

Transscleral stereotactic radiation dosing of porcine eyes results in no apparent clinical abnormalities at doses less than 24 Gy.

Editor's Note: A 1-Gy dose is equivalent to 1 joule (J) of radiation energy absorbed per kilogram of organ or tissue weight. Rad is the older, non-SI term and is still in use as a unit of absorbed dose (100 rad = 1 Gy). All values reported in rads should be converted to grays ([§18.5.11](#), Radiation, pp 816-817 in print).

6. The specific radioactivities ranged from 0.31 to 5.25 Ci/ μmol (11.6-194.3 GBq/ μmol) at the time of injection.

ANSWER:

The specific radioactivities ranged from 11.6 to 194.3 GBq/ μmol at the time of injection.

Editor's Note: Measurements of ionizing radiation and radioactivity should be reported in SI units. The unit for activity of a radionuclide is the becquerel. There is no need to dual report these values ([§18.5.11](#), Radiation, pp 816-817 in print).

7. Most of the 54 cancers among women with radiation doses higher than 100 rem were likely related to the radiation.

ANSWER:

Most of the 54 cancers among women with radiation doses higher than 1 Sv were likely related to the radiation.

Editor's Note: Measurements of ionizing radiation and radioactivity should be reported in SI units. The dose equivalent used to indicate the detrimental effects of an absorbed radiation dose on biological tissue is the sievert (Sv). Alpha particles produce greater harm than beta particles, γ -rays, and x-rays for a given absorbed dose. To account for this difference, radiation dose is expressed as equivalent dose in sieverts (Sv) ([§18.5.11](#), Radiation, pp 816-817 in print).



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8. Dental costs for the 18-month intervention were comparable between the groups (527 euros for the patient group vs 511 euros for the controls). (At the time of the study, 1 euro = US\$1.50.)

ANSWER:

Dental costs for the 18-month intervention were comparable between the groups (€527 for the patient group vs €511 for the controls). (At the time of the study, €1 = US\$1.50.)

Editor's Note: Amounts of money in US, Canadian, and British currency are expressed as a decimal number or whole number preceded by the symbol for the unit of measure for the currency. Use the € symbol rather than the word *euro*. For amounts reported in non-US currency, the exchange rate should be used to calculate the amount in US dollars, and that amount should be shown in parentheses ([§18.5.12](#), Currency, pp 817-819 in print).

9. The luteinizing hormone level was 142 mU/mL, and the follicle-stimulating hormone level was 77 mU/mL.

ANSWER:

The luteinizing hormone level was 142 mIU/mL, and the follicle-stimulating hormone level was 77 mIU/mL.

Editor's Note: For enzymatic activity, the international unit (IU) is used; 1 IU equals the amount of enzyme generating 1 μmol of product per minute ([§18.5.10](#), Laboratory Values, pp 797-816 in print).

10. Balanced salt solution contains 0.11 mol/L of sodium chloride (64%), which is a lower concentration than 0.154 mol/L of sodium chloride solution (0.9%).

ANSWER:

Balanced salt solution contains 0.11-mol/L sodium chloride (64%), which is a lower concentration than a 0.154-mol/L sodium chloride solution (0.9%).

Editor's Note: A *molar* solution contains 1 mol (1 g molecular weight) of solute in 1 L of solution. The SI style for reporting molar solutions is mol/L; for solutions with millimolar concentrations, mmol/L is used; and for solutions with micromolar concentrations, $\mu\text{mol/L}$ is used. The concentration is given as 4-mmol/L potassium chloride, *not* 4 mmol/L of potassium chloride. Molar concentrations of solutions and reagents also may be expressed by using M to



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designate molar and SI prefixes to denote concentration (eg, mM for millimolar; μM for micromolar), with the molar concentration unit set closed up to the number ([§18.5.7](#), Solutions and Concentrations, p 796 in print).

11. Patients in both groups were treated for 1 year and were asked to consume a 5021- to 6276-kJ/d diet (1200- to 1500-kcal/d diet) and to increase their physical activity.

ANSWER:

Patients in both groups were treated for 1 year and were asked to consume a 1200- to 1500-kcal/d diet and to increase their physical activity.

Editor's Note: Although the joule is the preferred SI unit for energy, the *AMA Manual of Style* recommends using calories or kilocalories to express the energy content of food ([§18.5.8](#), Energy, pp 796-797 in print).

12. Laboratory tests revealed the following values: white blood cells, $9.7 \times 10^9/\text{L}$ (85% neutrophils); platelets, $198 \times 10^9/\text{L}$; and red blood cells, $2.6 \times 10^{12}/\text{L}$.

ANSWER:

Laboratory tests revealed the following values: white blood cells, $9700/\mu\text{L}$ (85% neutrophils) (to convert to $\times 10^9/\text{L}$, multiply by 0.001); platelets, $198 \times 10^3/\mu\text{L}$ (to convert to $\times 10^9/\text{L}$, multiply by 1.0); and red blood cells, $2.6 \times 10^6/\mu\text{L}$ to convert to $\times 10^{12}/\text{L}$, multiply by 1.0).

Editor's Note: White blood cell, platelet, and red blood cell values should be reported in conventional units with conversions factors given in parentheses at first mention (although some journal, such as *JAMA*, may opt not to list conversion factors for any factor that is a multiple of 10). Refer to the table on pages 810 to 815 of the *AMA Manual of Style* for conversion factors ([§18.5.10](#), Laboratory Values, pp 797-816 in print).