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Title Clinical Indices and Outcomes Tools

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Description Collection of indices and tools relating to cardiovascular, nephrology, and hepatic research that aid epidemiological chort or retrospective chart review with big data. All indices and tools take commonly used lab values and patient demographics and measurements to compute various risk and predictive values for survival. References to original literature and validation contained in each function documentation.

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R topics documented:

aha_stroke	*Calculate Stroke Risk for General Population based off AHA Patient Stroke risk calculator*

Description

Using common patient history of comorbidities and conditions, in addition to traditional lifestyle factors, assess the total risk of suffering a stroke. Developed by the AHA and revised in 2023 for patient use, a positive score is associated with a high likelihood of suffering a stroke while a negative score has a low likelihood. Has not been validated for clinical use.

Usage

```
aha_stroke(bp, afib, sugar, bmi, diet, chol, dm, physical, hx, smoke)
```

Arguments

bp	Blood pressure greater than 120/80? 1 for yes or unsure / 0 for no.
afib	Diagnosed atrial fibrillation? 1 for yes or unsure / 0 for no.
sugar	Blood sugar greater than 100 mg/dL? 1 for yes or unsure / 0 for no.
bmi	BMI >25 kg/m^2? 1 for yes or unsure / 0 for no.
diet	Diet high in saturated/trans fats, sweetened bevs, salt, excess calories? 1 for yes or unsure / 0 for no.
chol	Total blood cholesterol >160 mg/dL? 1 for yes or unsure / 0 for no.
dm	Diagnosis of T2 diabetes mellitus? 1 for yes or unsure / 0 for no.
physical	Less than 150 minutes of moderate to vigorous intensite activity per week? 1 for yes or unsure / 0 for no.
hx	Personal or family hx of stroke, TIA, or heart attack? 1 for yes or unsure / 0 for no.
smoke	Use tobacco or vape? 1 for yes or unsure / 0 for no.

Value

A numeric value/vector with predicted stroke risk score.

References

"Stroke Risk Assessment." www.stroke.org, December 14, 2023. https://www.stroke.org/en/about-stroke/stroke-risk-factors/stroke-risk-assessment.

Examples

```
# The function is defined as
aha_stroke(1, 0, 1, 1, 0, 0, 0, 0, 1, 0)
```

---

albi	*Calculate ALBI (Albumin-Bilirubin) Grade for HCC (Hepatocellular Carcinoma)*

Description

Using non-SI/SI measurements of serum bilirubin and serum albumin, calculate the ALBI grade for patients with HCC. Developed by Johnson et al. 2015, an ALBI score of =<-2.60 is grade 1 with a median survival of 18.5-85.6 months, an ALBI score of -2.60 to (and including) -1.39 is grade 2 with a median survival of 5.3-46.5 months, and an ALBI score of >-1.39 is grade 3 with a median survival of 2.3-15.5 months. Validated by Hiroaka et al. 2017 and Chen et al. 2017.

Usage

```
albi(sbill, salb, units = "")
```

Arguments

sbill	Numeric value of serum bilirubin in either non-SI (mg/dL) or SI (umol/ml).
salb	Numeric value of serum albumin in either non-SI (g/dL) or SI (g/L).
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector with predicted ALBI score.

References

Johnson PJ, Berhane S, Kagebayashi C, et al. Assessment of liver function in patients with hepatocellular carcinoma: a new evidence-based approach-the ALBI grade. J Clin Oncol. 2015;33(6):550-558. doi:10.1200/JCO.2014.57.9151 Hiroaka A, Michitaka K, Kumada T, et al. Validation and Potential of Albumin-Bilirubin Grade and Prognostication in a Nationwide Survey of 46,681 Hepatocellular Carcinoma Patients in Japan: The Need for a More Detailed Evaluation of Hepatic Function. Liver Cancer. 2017;6(4):325-336. doi:10.1159/000479984 Chen B, Lin S. Albumin-bilirubin (ALBI) score at admission predicts possible outcomes in patients with acute-on-chronic liver failure. Medicine (Baltimore). 2017;96(24):e7142. doi:10.1097/MD.0000000000007142

Examples

```
# For non-SI measurements, the function is defined as
albi(1,3.7)

# For SI measurements, the function is defined as
albi(31,37, units = "SI")
```

---

apri   *Calculate APRI (AST to Platelet Ratio)*

Description

Using aspartate aminotransferase and platelet values, calculate the APRI index, devised by Wait et al 2003, estimates hepatic fibrosis and cirrhosis in patients with hepatitis C. APRI value <0.7 is indicative of little to no evidence of fibrosis, 0.7-1.0 is moderate fibrosis, and 1.0+ is evidence of cirrhosis and significant fibrosis, as validated by Khan et al. 2008 and Lin et al 2011.

Usage

```
apri(ast, plt)
```

Arguments

ast   Numeric value of aspartate aminotransferase in U/L.

plt   Numeric value of platelets in 10^3/uL or 10^9/L.

Value

A numeric value/vector with predicted APRI index score.

References

Wai CT, Greenson JK, Fontana RJ, et al. A simple noninvasive index can predict both significant fibrosis and cirrhosis in patients with chronic hepatitis C. Hepatology. 2003;38(2):518-526. doi:10.1053/jhep.2003.50346 Khan DA, Fatima-Tuz-Zuhra, Khan FA, Mubarak A. Evaluation of diagnostic accuracy of APRI for prediction of fibrosis in hepatitis C patients. J Ayub Med Coll Abbottabad. 2008;20(4):122-126. Lin, Z.-H., Xin, Y.-N., Dong, Q.-J., Wang, Q., Jiang, X.-J., Zhan, S.-H., Sun, Y. and Xuan, S.-Y. (2011), Performance of the aspartate aminotransferase-to-platelet ratio index for the staging of hepatitis C-related fibrosis: An updated meta-analysis. Hepatology, 53: 726-736. https://doi.org/10.1002/hep.24105

Examples

```
# The function is defined as
apri(16,150)
```

---

ast_alt_ratio_interpret

De Ritis Ratio (Ast/Alt Ratio)

Description

The De Ritis Ratio has been used clinically and in research for almost 50 years and is simply the ratio of aspartate transferase to alanine transferase. Validated in many cohorts, interpretations vary, and as such, I simply define a ratio of above 0.8 as indicative of liver injury, commonly agreed upon in the literature.

Usage

```
ast_alt_ratio_interpret(ast, alt)
```

Arguments

ast	Numeric value of aspartate transferase (U/L).
alt	Numeric value of alanine transferase (U/L).

Value

A numeric value/vector with whether by De Ritis ratio, there is liver injury.

References

Botros M, Sikaris KA. The de ritis ratio: the test of time. Clin Biochem Rev. 2013 Nov;34(3):117-30. PMID: 24353357; PMCID: PMC3866949.

Examples

```
# The function is defined as
ast_alt_ratio_interpret(30, 25)
```

---

bard_score *BARD Score for assessing Fibrosis in NAFLD*

Description

By using a patient's bmi, lab values of aspartate transferae, alanine transferase, and whether they have type 2 diabetes, calculate the patient's risk for fibrosis, especially if they have diagnosed or suspected NAFLD. BARD score from 0-1 is low risk of fibrosis and a score from 2-4 is high risk of fibrosis. Created by Harrison et al. 2008. Validated by Ruffillo et al. (2011) and Raszeja-wyszomirska et al. (2010).

Usage

```
bard_score(bmi, ast, alt, diabetes)
```

Arguments

bmi	Numeric value of bmi (kg/m^2).
ast	Numeric value of aspartate transferase (U/L).
alt	Numeric value of alanine transferase (U/L).
diabetes	Numeric value of type 2 diabetes mellitus status yes = 1, no = 0.

Value

A numeric value/vector with predicted BARD score.

References

Harrison SA, Oliver D, Arnold HL, Gogia S, Neuschwander-tetri BA. Development and validation of a simple NAFLD clinical scoring system for identifying patients without advanced disease. Gut. 2008;57(10):1441-7. Raszeja-wyszomirska J, Szymanik B, Ławniczak M, et al. Validation of the BARD scoring system in Polish patients with nonalcoholic fatty liver disease (NAFLD). BMC Gastroenterol. 2010;10:67. Ruffillo G, Fassio E, Alvarez E, et al. Comparison of NAFLD fibrosis score and BARD score in predicting fibrosis in nonalcoholic fatty liver disease. J Hepatol. 2011;54(1):160-3. Cichoż-lach H, Celiński K, Prozorow-król B, Swatek J, Słomka M, Lach T. The BARD score and the NAFLD fibrosis score in the assessment of advanced liver fibrosis in nonalcoholic fatty liver disease. Med Sci Monit. 2012;18(12):CR735-40.

Examples

```
# The function is defined as
bard_score(25, 40, 32, 1)
```

---

bard_score_interpret   *BARD Score for assessing Fibrosis in NAFLD Interpretation*

Description

By using a patient's bmi, lab values of aspartate transferae, alanine transferase, and whether they have type 2 diabetes, calculate the patient's risk for fibrosis, especially if they have diagnosed or suspected NAFLD. Created by Harrison et al. 2008. Validated by Ruffillo et al. (2011) and Raszeja-wyszomirska et al. (2010).

Usage

```
bard_score_interpret(bmi, ast, alt, diabetes)
```

Arguments

`bmi`	Numeric value of bmi (kg/m^2).
`ast`	Numeric value of aspartate transferase (U/L).
`alt`	Numeric value of alanine transferase (U/L).
`diabetes`	Numeric value of type 2 diabetes mellitus status yes = 1, no = 0.

Value

A string with interpreted BARD score as "high" or "low" fibrosis.

References

Harrison SA, Oliver D, Arnold HL, Gogia S, Neuschwander-tetri BA. Development and validation of a simple NAFLD clinical scoring system for identifying patients without advanced disease. Gut. 2008;57(10):1441-7. Raszeja-wyszomirska J, Szymanik B, Ławniczak M, et al. Validation of the BARD scoring system in Polish patients with nonalcoholic fatty liver disease (NAFLD). BMC Gastroenterol. 2010;10:67. Ruffillo G, Fassio E, Alvarez E, et al. Comparison of NAFLD fibrosis score and BARD score in predicting fibrosis in nonalcoholic fatty liver disease. J Hepatol. 2011;54(1):160-3. Cichoż-lach H, Celiński K, Prozorow-król B, Swatek J, Słomka M, Lach T. The BARD score and the NAFLD fibrosis score in the assessment of advanced liver fibrosis in nonalcoholic fatty liver disease. Med Sci Monit. 2012;18(12):CR735-40.

Examples

```
# The function is defined as
bard_score_interpret(25, 40, 32, 1)
```

---

eAG   *Calculate eAG (Estimated Average Glucose)*

Description

Using HbA1C (hemoglobin A1C) levels, estimate the average amount of glucose in one's body, derived by Nathan et al. 2008. Usage represents the average glucose level for a cumulative period of 3 months and has been shown to conocordant with fasting glucose levels. HbA1C levels range between 4-5.6 in non-diabetic populations.

Usage

```
eAG(a1c)
```

Arguments

`a1c`	Numeric value of percent glycolated hemoglobin (HbA1C).

Value

A numeric value/vector with predicted level of estimated average glucose.

References

Nathan DM, Kuenen J, Borg R, et al. Translating the A1C assay into estimated average glucose values [published correction appears in Diabetes Care. 2009 Jan;32(1):207]. Diabetes Care. 2008;31(8):1473-1478. doi:10.2337/dc08-0545

Examples

```
# The function is defined as
eAG(4)
```

---

fib4   *Calculate Fibrosis-4 (FIB-4) Index for Liver Fibrosis*

Description

Calculate the extent of liver fibrosis/scarring in HCV/HBV patients without biopsy or ultrasound, as deduced by Sterling et al. 2006. Patient validation has not been included in patients <35 or above 65. As validated by Kim et al. 2010 and McPherson et al. 2017, a FIB-4 score of <1.45 is a fibrosis stage of 0-1, FIB-4 1.45-3.25 is a stage of 2-3, and FIB-4 of >3.25 is a tage of 4-6.

Usage

```
fib4(age, ast, alt, plt)
```

Arguments

age	Numeric value of age in years.
ast	Numeric value of aspartate aminotransferase in U/L.
alt	Numeric value of alanine aminotransferase in U/L.
plt	Numeric value of platelets in 10^3/uL or 10^9/L.

Value

A numeric value/vector with predicted level of FIB-4 index liver fibrosis.

References

Sterling, R.K., Lissen, E., Clumeck, N., Sola, R., Correa, M.C., Montaner, J., S. Sulkowski, M., Torriani, F.J., Dieterich, D.T., Thomas, D.L., Messinger, D. and Nelson, M. (2006), Development of a simple noninvasive index to predict significant fibrosis in patients with HIV/HCV coinfection. Hepatology, 43: 1317-1325. https://doi.org/10.1002/hep.21178 Kim BK, Kim DY, Park JY, et al. Validation of FIB-4 and comparison with other simple noninvasive indices for predicting liver fibrosis and cirrhosis in hepatitis B virus-infected patients. Liver Int. 2010;30(4):546-553. doi:10.1111/j.1478-3231.2009.02192.x Mcpherson S, Hardy T, Dufour JF, et al. Age as a Confounding Factor for the Accurate Non-Invasive Diagnosis of Advanced NAFLD Fibrosis. Am J Gastroenterol. 2017;112(5):740-751.

Examples

```
# The function is defined as
fib4(40,15,7,175)
```

---

fli   *Calculate FLI (Fatty Liver Index)*

Description

Using non-SI/SI lab values and measurements, diagnose the risk of having a fatty liver without the need for liver ultrasound. Created by Bedogni et al. 2006, this index has been validated by Cuthberson et al. 2014 and Koehler et al. 2013 for use in multimodal populations, with FLI values of <30 being low risk of fatty liver (LR= -0.2), FLI betwen 30 and 60 being indeterminate of risk, and FLI >60 indicative of high risk of fatty liver (LR = 4.3).

Usage

```
fli(trigly, bmi, waist, ggt, units = "")
```

Arguments

trigly	Numeric value of triglycerides in either SI (mmol/L) or non-SI (mg/dL).
bmi	Numeric value of BMI in kg/m^2.
waist	Numeric value of waist circumference in cm.
ggt	Numeric value of gamma glutyl transpeptidase (GGT) in U/L.
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector with predicted fatty liver index value.

References

Bedogni, G., Bellentani, S., Miglioli, L. et al. The Fatty Liver Index: a simple and accurate predictor of hepatic steatosis in the general population. BMC Gastroenterol 6, 33 (2006). https://doi.org/10.1186/1471-230X-6-33 Cuthbertson DJ, Weickert MO, Lythgoe D, et al. External validation of the fatty liver index and lipid accumulation product indices, using 1H-magnetic resonance spectroscopy, to identify hepatic steatosis in healthy controls and obese, insulin-resistant individuals. Eur J Endocrinol. 2014;171(5):561-569. doi:10.1530/EJE-14-0112 Koehler EM, Schouten JN, Hansen BE, Hofman A, Stricker BH, Janssen HL. External validation of the fatty liver index for identifying nonalcoholic fatty liver disease in a population-based study. Clin Gastroenterol Hepatol. 2013;11(9):1201-4.

Examples

```
# For non-SI measurements, the function is defined as
fli(125, 20, 25, 16)

# For SI measurements, the function is defined as
fli(1.5, 20, 25, 16, units = "SI")
```

---

homair	*Calculate HOMA-IR (Homeostatic Model Assessment for Insulin Resistance)*

Description

Using non-SI/SI measurements of glucose and insulin, approximate the levels of insulin resistance (or performance of B-cells) by means of the Matthews et al. 1985 formula. According to Cacho et al. 2008, normal measurements vary from 0.7-2, but will depend on the exact reference population being used. A value of above 2 indicates insulin resistance and a value below 0.7 is inconclusive.

Usage

```
homair(insulin,glucose, units = "")
```

Arguments

insulin	Numeric value of insulin in either SI (pmol/L) or non-SI (uIU/ml).
glucose	Numeric value of glucose in either non-SI (mg/dL) or non-SI (mmol/L).
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector with predicted level of insulin resistance.

References

Matthews DR, Hosker JP, Rudenski AS, Naylor BA, Treacher DF, Turner RC. Homeostasis model assessment: insulin resistance and beta-cell function from fasting plasma glucose and insulin concentrations in man. Diabetologia. 1985;28(7):412-419. doi:10.1007/BF00280883 Cacho J, Sevillano J, de Castro J, Herrera E, Ramos MP. Validation of simple indexes to assess insulin sensitivity during pregnancy in Wistar and Sprague-Dawley rats. Am J Physiol Endocrinol Metab. 2008;295(5):E1269-E1276. doi:10.1152/ajpendo.90207.2008

Examples

```
# For non-SI measurements, the function is defined as
homair(20,70)

# For SI measurements, the function is defined as
homair(100,4, units = "SI")
```

---

kidney_risk_num   *Calculate Kidney Failure Risk Index*

Description

Using commonly available lab values, calculate the risk index of developing kidney failure in patients with CKD, as devised by Tangri et al. 2011 and validated by Tangri et al. 2016.

Usage

```
kidney_risk_num(egfr, sex, acr, age, alb, phos, bicarb, calc, units="")
```

Arguments

egfr	Numeric value of eGFR in mL/min/1.73m^2.
sex	Char of M (male) or F (female).
acr	Numeric value of urine albumin/creatinine ratio in mg/g.
age	Numeric value of age in years.
alb	Numeric value of serum albumin in either non-SI (g/dL) or SI (g/L).
phos	Numeric value of serum phosphorous in either non-SI (mg/dL) or SI (mmol/L).
bicarb	Numeric value of serum bicarbonate in either non-SI (mEq/L) or SI (mmol/L).
calc	Numeric value of serum calcium in either non-SI (mg/dL) or SI (mmol/L).
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector of the chance of developing kidney failure.

References

Tangri N, Stevens LA, Griffith J, et al. A predictive model for progression of chronic kidney disease to kidney failure. JAMA. 2011;305(15):1553-9. Tangri N, Grams ME, Levey AS, et al. Multinational Assessment of Accuracy of Equations for Predicting Risk of Kidney Failure: A Meta-analysis. JAMA. 2016;315(2):164-74.

Examples

```
# For non-SI measurements, the function is defined as
kidney_risk_num(10, "F", 29, 31, 2.7, 3.6, 18, 10)

# For SI measurements, the function is defined as
kidney_risk_num(10, "F", 29, 31, 2.7, 2, 18, 2.5, units = "SI")
```

---

kid_risk_perc   *Calculate Kidney Failure Risk Percent*

Description

Using commonly available lab values, calculate the percent chance of developing kidney failure in patients with CKD, as devised by Tangri et al. 2011 and validated by Tangri et al. 2016.

Usage

```
kid_risk_perc(egfr, sex, acr, age, alb, phos, bicarb, calc, units="")
```

Arguments

egfr	Numeric value of eGFR in mL/min/1.73m^2.
sex	Char of M (male) or F (female).
acr	Numeric value of urine albumin/creatinine ratio in mg/g.
age	Numeric value of age in years.
alb	Numeric value of serum albumin in either non-SI (g/dL) or SI (g/L).
phos	Numeric value of serum phosphorous in either non-SI (mg/dL) or SI (mmol/L).
bicarb	Numeric value of serum bicarbonate in either non-SI (mEq/L) or SI (mmol/L).
calc	Numeric value of serum calcium in either non-SI (mg/dL) or SI (mmol/L).
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector of the percent chance of developing kidney failure.

References

Tangri N, Stevens LA, Griffith J, et al. A predictive model for progression of chronic kidney disease to kidney failure. JAMA. 2011;305(15):1553-9. Tangri N, Grams ME, Levey AS, et al. Multinational Assessment of Accuracy of Equations for Predicting Risk of Kidney Failure: A Meta-analysis. JAMA. 2016;315(2):164-74.

Examples

```
# For non-SI measurements, the function is defined as
kid_risk_perc(10, "F", 29, 31, 2.7, 3.6, 18, 10)

# For SI measurements, the function is defined as
kid_risk_perc(10, "F", 29, 31, 2.7, 2, 18, 2.5, units = "SI")
```

---

meld_xi	*Calculate MELD-XI (Model for End Stage Liver Disease Excluding INR)*

Description

Using serum bilirubin and serum creatinine, calculate the MELD Exclusing INR, which models closely with MELD, as devised by Heuman et al. 2007. Validated for use by Wernly et al. 2017, cutoffs for MELD and MELD-XI appear identical in practice, the former of which used by UNOS for organ transplantation need. More research needs to be done to calculate associated survival or cutoff values.

Usage

```
meld_xi(sbill, screat)
```

Arguments

sbill	Numeric value of serum bilirubin in mg/dL.
screat	Numeric value of serum creatinine in mg/dL.

Value

A numeric value/vector with MELD-XI score (comparable to MELD scores).

References

Heuman, D.M., Mihas, A.A., Habib, A., Gilles, H.S., Stravitz, R.T., Sanyal, A.J. and Fisher, R.A. (2007), MELD-XI: A rational approach to "sickest first" liver transplantation in cirrhotic patients requiring anticoagulant therapy. Liver Transpl, 13: 30-37. https://doi.org/10.1002/lt.20906 Wernly B, Lichtenauer M, Franz M, et al. Model for End-stage Liver Disease excluding INR (MELD-XI) score in critically ill patients: Easily available and of prognostic relevance. PLoS One. 2017;12(2):e0170987. Published 2017 Feb 2. doi:10.1371/journal.pone.0170987

Examples

```
# The function is defined as
meld_xi(0.6,0.65)
```

---

nafld_score   *Non-Alcoholic Fatty Liver Disease (NAFLD) Fibrosis Score*

Description

Using SI/non-SI measurements of albumin, and age, bmi, impaired fasting glucose/diabetes, aspartate trasnferase, alanine transferase, and platelet counts, calcualte the level of scarring in the liver from F0-F2 (no-moderate fibrosis) to F3-F4 (severe fibrosis - cirrhosis). Scores below -1.455 are associated with F0-F2 and scores above 0.675 are associated with F3-F4, with inbetween scores being indeterminate. Created by Angulo et al. (2007) and validated by Treeprasertsuk et al. (2013).

Usage

```
nafld_score(age, bmi, diabetes, ast, alt, platelet, albumin, units = "")
```

Arguments

age	Numeric value of age.
bmi	Numeric value of bmi (kg/m^2).
diabetes	If impaired fasting glucose or type 2 diabetes mellitus is true, 1, if not, 0.
ast	Numeric value of aspartate transferase (U/L).
alt	Numeric value of alanine transferase (U/L).
platelet	Numeric value of platelet count in either 10^9/L or 10^3/uL.
albumin	Numeric value of serum albumin in either non-SI (g/dL) or SI (g/L).
units	String to specify non-SI units by not including units argument or SI units by including units="SI".

Value

A numeric value/vector with predicted NAFLD fibrosis score.

References

Angulo P, Hui JM, Marchesini G, Bugianesi E, George J, Farrell GC, Enders F, Saksena S, Burt AD, Bida JP, Lindor K, Sanderson SO, Lenzi M, Adams LA, Kench J, Therneau TM, Day CP. The NAFLD fibrosis score: a noninvasive system that identifies liver fibrosis in patients with NAFLD. Hepatology. 2007 Apr;45(4):846-54. PMID: 17393509. Treeprasertsuk S, Björnsson E, Enders F, Suwanwalaikorn S, Lindor KD. NAFLD fibrosis score: A prognostic predictor for mortality and liver complications among NAFLD patients. World Journal of Gastroenterology. 2013;19(8):1219-1229. doi:10.3748/wjg.v19.i8.1219. Tapper EB, Lok AS. Use of Liver Imaging and Biopsy in Clinical Practice. N Engl J Med. 2017;377(8):756-768.

Examples

```
# For non-SI measurements, the function is defined as
nafld_score(50, 28, 1, 15, 2, 170, 3.5, units = "")

# For SI measurements, the function is defined as
nafld_score(50, 28, 1, 15, 2, 170, 3.5, units = "SI")
```

---

rfactor   *R Factor for Liver Injury*

Description

Using alanine aminotransferase and alkaline phosphatase calculate an index that can distinguish between hepatocellulal, cholestatic, or a combination of both in patients presenting with acute liver injury. Recommended for use in risk stratification and diagnosis by the American College of Gastroenterology.

Usage

```
rfactor(alt, alp)
```

Arguments

alt	Numeric value of alanine aminotransferase (U/L).
alp	Numeric value of alkaline phosphatase (U/L).

Value

A numeric value/vector with predicted cause of liver injury.

References

Bénichou C. Criteria of drug-induced liver disorders. Report of an international consensus meeting. J Hepatol. 1990;11(2):272-6. Chalasani NP, Hayashi PH, Bonkovsky HL, et al. ACG Clinical Guideline: the diagnosis and management of idiosyncratic drug-induced liver injury. Am J Gastroenterol. 2014;109(7):950-66.

Examples

```
# The function is defined as
rfactor(40, 50)
```

rfactor_interpret *R Factor for Liver Injury Interpreted*

Description

Using alanine aminotransferase and alkaline phosphatase calculate an index that can distinguish between hepatocellulal, cholestatic, or a combination of both in patients presenting with acute liver injury. Index value is then interpreted in the ocntext of hepatocellular or cholestatic disease. Recommended for use in risk stratification and diagnosis by the American College of Gastroenterology.

Usage

```
rfactor_interpret(alt, alp)
```

Arguments

alt   Numeric value of alanine aminotransferase (U/L).

alp   Numeric value of alkaline phosphatase (U/L).

Value

A numeric value/vector with predicted R factor score.

References

Bénichou C. Criteria of drug-induced liver disorders. Report of an international consensus meeting. J Hepatol. 1990;11(2):272-6. Chalasani NP, Hayashi PH, Bonkovsky HL, et al. ACG Clinical Guideline: the diagnosis and management of idiosyncratic drug-induced liver injury. Am J Gastroenterol. 2014;109(7):950-66.

Examples

```
# The function is defined as
rfactor_interpret(40, 50)
```

Index