Abstract: The objective of the study was to determine completeness of 24-hour urine collection in pregnancy. This was a retrospective laboratory/chart review of 24-hour urine collections at British Columbia Women’s Hospital. Completeness was assessed by 24-hour urinary creatinine excretion (UcreatV): expected according to maternal weight for single collections and between-measurement difference for serial collections. For 198 randomly selected pregnant women with a hypertensive disorder (63% preeclampsia), 24-hour urine collections were frequently inaccurate (13-54%) on the basis of UcreatV of 97-220 micromol/kg per day (11.0-25.0 mg/kg per day) or 133-177 micromol/kg per day (15.1-20.1 mg/kg per day) of prepregnancy weight (respectively). Lean body weight resulted in more inaccurate collections (24-68%). The current weight was frequently unavailable (28%) and thus not used. For 161 women (81% proteinuric) with serial 24-hour urine levels, a median [interquartile range] of 11 [5-31] days apart, between-measurement difference in UcreatV was 14.4% [6.0-24.9]; 40 women (24.8%) had values 25% or greater, exceeding analytic and biologic variation. Twenty-four hour urine collection is frequently inaccurate and not a precise measure of proteinuria or creatinine clearance.

PubMed ID: 18718568 View in PubMed

Abundance of the Na-K-2Cl cotransporter NKCC2 is increased by high-fat feeding in Fischer 344 X Brown Norway (F1) rats.

https://arctichealth.org/en/permalink/ahliterature90141

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Source: Am J Physiol Renal Physiol. 2009 Apr;296(4):F762-70

Date: Apr-2009

Language: English

Publication Type: Article
Abstract:
Insulin resistance is associated with hypertension by mechanisms likely involving the kidney. To determine how the major apical sodium transporter of the thick ascending limb, the bumetanide-sensitive Na-K-2Cl cotransporter (NKCC2) is regulated by high-fat feeding, we treated young male, Fischer 344 X Brown Norway (F344BN) rats for 8 wk with diets containing either normal (NF, 4%) or high (HF, 36%) fat, by weight, primarily as lard. HF-fed rats had impaired glucose tolerance, increased urine excretion of 8-isoprostane (a marker of oxidative stress), increased protein levels for NKCC2 (50-125%), and the renal outer medullary potassium channel (106%), as well as increased natriuretic response to furosemide (20-40%). To test the role of oxidative stress in this response, in study 2, rats were fed the NF or HF diet plus plain drinking water, or water containing N(G)-nitro-l-arginine methyl ester (l-NAME), a nitric oxide synthase inhibitor (100 mg/l), or tempol, a superoxide dismutase mimetic (1 mmol/l). The combination of tempol with HF nullified the increase in medullary NKCC2, while l-NAME with HF led to the highest expression of medullary NKCC2 (to 498% of NF mean). However, neither of these drugs dramatically affected the elevated natriuretic response to furosemide with HF. Finally, l-NAME led to a marked increase in blood pressure (measured by radiotelemetry), which was significantly enhanced with HF. Mean arterial blood pressure at 7 wk was as follows (mmHg): NF, 100 +/- 2; NF plus l-NAME, 122 +/- 3; and HF plus l-NAME, 131 +/- 2. Overall, HF feeding increased the abundance of NKCC2. Inappropriately high sodium reabsorption in the thick ascending limb via NKCC2 may contribute to hypertension with insulin resistance.
The accuracy of predicting cardiovascular death based on one compared to several albuminuria values.

https://arctichealth.org/en/permalink/ahliterature260540

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Source: Kidney Int. 2014 Jun;85(6):1421-8

Date: Jun-2014

Language: English

Publication Type: Article

Keywords: Adult
Aged
Aged, 80 and over
Albumins - metabolism
Albuminuria - diagnosis - mortality - urine
Biological Markers - urine
Cardiovascular Diseases - diagnosis - mortality
Creatinine - urine
Female
Follow-Up Studies
Humans
Male
Middle Aged
Norway
Predictive value of tests
Prognosis
Prospective Studies
Risk assessment
Risk factors
Time Factors
Urinalysis
Abstract: Albuminuria is a well-documented predictor of cardiovascular (CV) mortality. However, day-to-day variability is substantial, and there is no consensus on the number of urine samples required for risk prediction. To resolve this we followed 9158 adults from the population-based Nord-Trøndelag Health Study for 13 years (Second HUNT Study). The predictive performance of models for CV death based on Framingham variables plus 1 versus 3 albumin-creatinine ratio (ACR) was assessed in participants who provided 3 urine samples. There was no improvement in discrimination, calibration, or reclassification when using ACR as a continuous variable. Difference in Akaike information criterion indicated an uncertain improvement in overall fit for the model with the mean of 3 urine samples. Criterion analyses on dichotomized albuminuria information sustained 1 sample as sufficient for ACR levels down to 1.7?mg/mmol. At lower levels, models with 3 samples had a better overall fit. Likewise, in survival analyses, 1 sample was enough to show a significant association to CV mortality for ACR levels above 1.7?mg/mmol (adjusted hazard ratio 1.37; 95% CI 1.15-1.63). For lower ACR levels, 2 or 3 positive urine samples were needed for significance. Thus, multiple urine sampling did not improve CV death prediction when using ACR as a continuous variable. For cutoff ACR levels of 1.0?mg/mmol or less, additional urine samples were required, and associations were stronger with increasing number of samples.

PubMed ID: 24352157 View in PubMed

Albuminuria, metabolic syndrome and the risk of mortality and cardiovascular events.
https://arctichealth.org/en/permalink/ahliterature90754

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Source: Atherosclerosis. 2009 Jun;204(2):503-8

Date: Jun-2009

Language: English

Publication Type: Article
Keywords: Aged
Albuminuria - complications - mortality - urine
Biological Markers - urine
Creatinine - urine
Female
Humans
Incidence
Male
Metabolic Syndrome X - complications - mortality
Middle Aged
Myocardial Infarction - etiology - mortality
Norway - epidemiology
Population Surveillance
Proportional Hazards Models
Prospective Studies
Risk assessment
Risk factors
Stroke - etiology - mortality
Time Factors

Abstract: AIM: Increased urinary albumin-excretion is a cardiovascular risk-factor. The cardiovascular risk of the metabolic syndrome (MetS) is debated. The aim of the present prospective, population-based study of non-diabetic individuals was to examine the association between low-grade urinary albumin-excretion, MetS, and cardiovascular morbidity and all-cause mortality. METHODS: 5215 non-diabetic, non-proteinuric men and women participating in the Tromsø Study 1994-1995 were included. Urinary albumin-creatinine ratio (ACR) was measured in three urine samples. The participants were categorized into four groups by the presence/absence of MetS (the International Diabetes Federation definition) and ACR in the upper tertile (>or=0.75 mg/mmol). RESULTS: Median follow-up time was 9.6 years for first ever myocardial infarction, 9.7 years for ischemic stroke and 12.4 years for mortality. High ACR (upper tertile)/MetS was associated with increased risk of myocardial infarction (hazard ratio (HR) 1.75; 95% confidence interval (CI): 1.30-2.37, por=0.75 mg/mmol was associated with cardiovascular morbidity and all-cause mortality independently of MetS. MetS was not associated with any end-point beyond what was predicted from its components. Thus, low-grade albuminuria, but not MetS, may be used for risk stratification in non-diabetic subjects.

Notes: Comment In: Atherosclerosis. 2009 Jun;204(2):348-9; author reply 350-119201409
PubMed ID: 19091314 View in PubMed

Alkylresorcinol metabolites in urine correlate with the intake of whole grains and cereal fibre in free-living Swedish adults.

https://arctichealth.org/en/permalink/ahliterature125563

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Alkylresorcinols (AR) have been established as short/medium-term biomarkers for whole grain (WG) wheat and rye intake; and AR metabolites, 3,5-dihydroxybenzoic acid and 3-(3,5-dihydroxyphenyl)-propanoic acid, have been suggested as complementary biomarkers to AR. The present study examined the medium-term reproducibility and relative validity of urinary AR metabolites as biomarkers for WG and cereal fibre intake. A total of sixty-six free-living Swedes completed 3 d weighed food records and provided single 24 h urine collections and morning urine spot samples on two occasions, 2-3 months apart. The medium-term reproducibility of urinary AR metabolites was moderate when assessed in 24 h collections and lower in creatinine (CR)-adjusted morning urine. Mean AR metabolite 24 h excretions correlated well with total WG ($r(s)$ 0.31-0.52, $P$...
The exposure to polycyclic aromatic hydrocarbons (PAH) was measured in a Finnish coking plant over a 7-year period (1988-1994), since the beginning of production. Hygienic measurements including dust and vapour sampling were performed and the correlations between the concentrations of airborne pyrene with the levels of pyrene metabolite 1-pyrenol in urine were calculated. The profile of measured 12 or 15 PAHs was very similar between mean concentrations of personal samples, which suggests that it is possible to calculate the concentrations of total PAH by using e.g. pyrene as a marker compound. Measurements suggest that the progress of working conditions has been very favourable because the mean exposure level of shift workers to benzo[a]pyrene has decreased from 2.5 micrograms/m³ to 0.3 micrograms/m³. This points to successful measures of technical prevention. The mean concentration of 1-pyrenol in urine has been 0.2-0.6 mumol/mol creatinine. The concentration increases slightly towards the end of the working day, but the correlation urinary pyrenol and air pyrene was weak. Therefore the usefulness of pyrenol level for predicting the pyrene concentration at low exposure level in the ambient air is very limited.
The International Agency for Research on Cancer classifies specific polycyclic aromatic hydrocarbons (PAHs) as probable carcinogens. This study compares two PAH biomarkers and their relationship with geographic information system (GIS) based traffic density (a proxy of PAH exposure), and explores the determinants of the PAH biomarkers.

A cross-sectional study was conducted in Montreal with 200 volunteers (107 females and 93 males) ages 20 to 53 years. Data were collected by questionnaire, urine samples were used for biomarker analysis, and innovative GIS-based time- and distance-weighted traffic densities (TDWTD) were calculated for all locations of participants during the 48 h prior to urine collection.

Detection rates of the two biomarkers were greater than 95%. Female participants had higher 1-OHP and 1-OHPG levels than males, and no relationship was detected between TDWTD in 48 h and the two PAH biomarkers. Biomarker levels were related to smoking more than one pack of cigarettes in the previous 48 h, and among non-smokers, barbecued meat consumption increased the level of urinary 1-OHP (exp β: 1.45, 95% CI: 1.07 to 1.98). Both 1-OHP and 1-OHPG can be used to assess the relatively low PAH levels to which the general population is exposed. With the exception of smoking, the impact of PAH exposure factors on the biomarkers is relatively small in this study population.
Biological monitoring of environmental exposure to PAHs in the vicinity of a Söderberg aluminium reduction plant.

https://arctichealth.org/en/permalink/ahliterature207775

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Date: Aug-1997

Language: English

Publication Type: Article

Keywords: Adult
Aluminum
Biological Markers - urine
Case-Control Studies
Chromatography, High Pressure Liquid
Environmental Monitoring - methods
Epidemiological Monitoring
Female
Humans
Male
Metallurgy
Middle Aged
Pilot Projects
Polycyclic Compounds - urine
Pyrenes - analysis
Quebec - epidemiology

Abstract: To assess environmental exposure to polycyclic aromatic hydrocarbons (PAHs) in the vicinity of a Söderberg aluminium reduction plant in Shawinigan, Canada with urinary 1-hydroxypyrene (1-OHP) as a biomarker. Urine samples were collected from 20 non-occupationally exposed subjects living less than 500 m from the plant and from 20 controls living in Trois-Rivières, another industrial town 40 km from Shawinigan. Concentrations of 1-OHP were measured by high performance liquid chromatography (HPLC). Among controls, geometric mean (range) 1-OHP concentrations were 0.046 (0.012-0.116) mumol/mol creatinine in non-smokers and 0.125 (0.051-0.282) mumol/mol creatinine in smokers. Among exposed subjects, values were 0.103 (0.056-0.196) mumol/mol creatinine in non-smokers and 0.250 (0.112-0.448) mumol/mol creatinine in smokers. Excretion of 1-OHP was significantly higher in exposed subjects than in controls among non-smokers and smokers (P

Notes: Cites: J Chromatogr. 1987 Jan 23;413:227-323558672
Cites: Am J Epidemiol. 1994 Feb 1;139(3):250-628116600
Cites: Environ Health Perspect. 1995 Sep;103(9):838-437498096
Cites: J Anal Toxicol. 1994 Sep;18(5):261-47990443
Cites: Cancer Epidemiol Biomarkers Prev. 1995 Jan-Feb;4(1):69-777894326
Changes in iodine excretion in 50-69-y-old denizens of an Arctic society in transition and iodine excretion as a biomarker of the frequency of consumption of traditional Inuit foods.

https://arctichealth.org/en/permalink/ahliterature4745

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Date: Mar-2005

Language: English

Publication Type: Article

Keywords: Aged
          Biological Markers - urine
          Cohort Studies
          Diet
          Diet Surveys
          Dietary Supplements
          Female
          Food Habits - ethnology
          Greenland
          Humans
          Inuits
          Iodine - administration & dosage - deficiency - urine
          Life Style
          Male
          Middle Aged
          Multivariate Analysis
          Nutritional Requirements
          Nutritional Status
          Questionnaires - standards
          Research Support, Non-U.S. Gov't
BACKGROUND: Iodine intake in Greenland has been hypothesized to exceed 10 times the recommended amount. The transition from a traditional Arctic society may change the iodine intake, but no field studies have been performed. OBJECTIVE: We aimed to ascertain iodine intakes, factors affecting iodine intake in circumpolar populations, and the usefulness of urinary iodine excretion as a biomarker for validation of Inuit food-frequency questionnaires. DESIGN: Data were collected in a cohort study of 4 Greenland population groups: Inuit living in the capital city, the major town, and settlements in East Greenland and non-Inuit. Supplement use and lifestyle factors were evaluated with questionnaires, and dietary habits were ascertained with a food-frequency questionnaire. Iodine was measured in spot urine samples. RESULTS: One percent of the population of Greenland was invited, and the participation rate was 95%. Less than 5% of Inuit but 55% of non-Inuit had urinary iodine excretion.

PubMed ID: 15755836 View in PubMed

Comparison of parental reports of smoking and residential air nicotine concentrations in children.
https://arctichealth.org/en/permalink/ahliterature81084

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Source: Occup Environ Med. 2006 Nov;63(11):766-72

Date: Nov-2006

Language: English

Publication Type: Article
Abstract: BACKGROUND: Using questionnaires to assess children's residential exposure to environmental tobacco smoke (ETS) may result in misclassification from recall and response bias. Questionnaire data have frequently been validated against urinary cotinine measurements, but rarely against actual measurements of residential air nicotine. OBJECTIVE: To compare questionnaire reported smoking with air nicotine concentrations in a large population of children and with urinary cotinine levels in a subpopulation; and to assess the potential impact of the symptom status of the children on the agreement between different measures of exposure. METHODS: The authors assessed residential exposure to ETS in 347 German, 335 Dutch, and 354 Swedish preschool and schoolchildren by questionnaire and air nicotine measurements, and in a subset of 307 German children by urinary cotinine measurements. They then compared the different measures of ETS exposure. RESULTS: In all countries, air nicotine concentrations increased with increasing questionnaire reported smoking in a dose-response fashion. Specificity and negative predictive values of questionnaire reports for nicotine concentrations were excellent. Sensitivity and positive predictive values were moderate to good. Excluding occasional smokers, the overall percentage of homes misclassified was 6.9%, 6.7%, and 5.1% in Germany, the Netherlands, and Sweden, respectively. Similar results were found for the agreement of urinary cotinine concentrations with questionnaire reports and air nicotine levels. There was no indication of underreporting by parents of symptomatic children. CONCLUSION: Despite some misclassification, questionnaire reports are an inexpensive and valid estimate of residential ETS exposure among preschool and school children.

PubMed ID: 16912089 View in PubMed