Bladder Catheters and Zinc Contamination of Urine,
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Despite publications on the contribution of urinary zinc
excretion to hypozincemia in surgery (1, 2) and burns (3, 4),
no attention has been paid to possible contamination from
bladder catheters. We evaluated zinc content and zinc release
from two latex (Norta no. 9385, BDF, Hamburg, F.R.G.; Akro-sil
no. 14160, Akro Catheters Inc., Zutphen, The Netherlands)
and one silicon (Silkomed no. 170605; Rusch Brilliant, Waiblingen, F.R.G.)
bladder catheter.

Zinc content was determined with neutron activation
analysis: we irradiated 1 cm of catheter for 1 h, using a
neutron flux of \( 5 \times 10^{12} \text{ cm}^{-2} \text{s}^{-1} \). Activities of samples and of
zinc metal standards were measured with a Ge (Li) detector.
Zinc release from the catheters was measured as follows:
The catheter tips were connected to a reservoir containing
Na\(_2\)EDTA (Complexon III; Merck, Darmstadt, F.R.G.) in
distilled water (5) or urine. We collected 60-mL samples at
the opposite ends at hourly intervals for 8 h. Zinc was
determined by flame atomic absorption spectrophotometry.
All additional materials were rinsed with a 1 mol/L solution of
HCl.

Both latex catheters contained large amounts of zinc
(Norta: 43 ± 2 µmol/g; Akro-sil: 37 ± 2 µmol/g), because zinc oxide is used during vulcanization. The zinc around the
lumen was accessible to the perfusates (Figure 1) and to the
same extent to Na\(_2\)EDTA and urine. Extrapolating from
an average release of 1.22 µmol per h, release in 24 h (viz., in
1.44 L) would be about 1.78 µmol, or 1.24 µmol/L. Compared
with normal zinc concentrations in urine [7.0 ± 3.5 µmol/L
(6)], addition of 1.24 µmol of zinc per liter from the catheter
would cause an error of 12–35%. It is notable that 40% of the
zinc was released from the catheter within the first hour.

The Silkomed catheter contained relatively little zinc (1.4
± 0.3 µmol/g) and releases were so small (0.03 ± 0.01
µmol/L h) that this influence on urinary zinc would remain
unnoticed. We therefore consider it suitable for studies on
zinc excretion.

This study was supported by a grant from the Dutch Burns
Association, Beverwijk, The Netherlands.

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One-Step Enzyme Immunoassay for Free Thyroxin:
Results with Dysalbuminemic Sera and One Serum
Containing Autoantibodies to Thyroxin, R. Sapin, F.
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The reliability of a new one-step enzyme immunoassay
(ELA) for free thyroxin (FT\(_4\)) (1) was indicated by the good
correlation between results determined by this method and
those by the two-step “Gammacoat” RIA (Clinical Assays,
Cambridge, MA). As stated in the conclusion (1), further
studies with sera from cases of familial dysalbuminemic
hyperthyroxinemia (FDH) and with samples containing
anti-T\(_4\) autoantibodies are required. Indeed, these two situations
of euthyroid hyperthyroxinemia are known to induce
artificially high FT\(_4\) values when measured by a one-step
RIA (e.g., Amerlex’s Amerlex-M) (2, 3) but values that are
more clinically reliable when measured by equilibrium
dialysis or the two-step Gammacoat method (4, 5).

Using this new ELA, now commercially available as the
"Enzymum-test FT\(_4\)" (Boehringer, Mannheim, F.R.G.), we
assayed FT\(_4\) in sera from four patients with FDH, detected
by using the screening test of Stockigt et al. (6), and in one
serum containing autoantibodies to T\(_4\) detected according
to Allan et al. (3). Our results were as follows:

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