

# One Size Does Not Fit All: Interpreting Laboratory Data in Pediatric Patients

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## The Problem

- Many commercial laboratory reports are designed for adult patients
- The normal values are different in children, both in range and in units of measure
- Normal values for children also vary with age
- Converting this data by hand is very time-consuming and prone to error, and requires looking up references

## The Solution

- We developed a spreadsheet template called StoneSheet.
- The spreadsheet works with existing office software already found in most pediatric facilities; no installation is required.
- Most potential users already have a basic familiarity with spreadsheet software. An intuitive visual interface and help balloons make the software accessible to persons with minimal computer skills.

## Functions of StoneSheet

- Converts results to units of measurement used in pediatrics
- Calculates patient age and selects appropriate reference range
- Flags out-of-range values
- Presents data in numeric and color-coded graphic formats
- Creates optional printable output which meets hospital requirements for medical records

## Discussion

This free solution can easily be shared with a large number of potential users. This demonstrates how clinicians can use existing computer resources to develop effective solutions to problems in clinical practice, making their work more efficient and accurate.

## Goals for our Solution

- Fully automated
- User-friendly, requiring only basic computer skills
- Easy to interpret
- No capital expenditure required

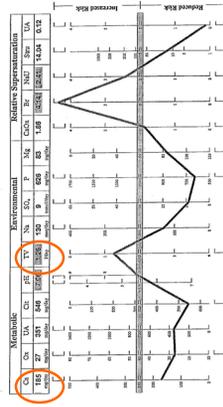
## Potential Users

- Pediatricians
- Family Physicians
- Urologists
- Other health care providers who take care of children

## For more information:

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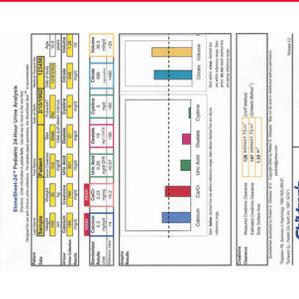
## Source Data



## Manual Solution

36 kg  
 $Ca: 105 \text{ mg/dL} = 5.3 \text{ mg/kg/d} \rightarrow 10 \text{ h}$   
 $35 \text{ kg} \rightarrow 76 \text{ mg} = 2.2 \text{ mg/dL}$   
 $Cr: 1.4 \text{ mg/dL} = 11.4 \text{ mg/dL}$   
 $Ca: 88 \text{ mg/dL} = 18.7 \text{ mg/dL} = 0.33 \rightarrow 10 \text{ h}$   
 $Cl: 100 \text{ mg/dL} = 43 \text{ mg/dL}$   
 $K: 4.0 \text{ mg/dL} = 27.9 \text{ mg/dL}$   
 $CO_2: 24 \text{ mg/dL} = 27.9 \text{ mg/dL} = 0.6 \text{ mg/dL def.}$   
 $Hb: 15.0 \text{ g/dL} = 1.35 \text{ g/dL}$   
 $Hct: 45\% = 19 \text{ mg/100 mL}$   
 $WBC: 12.0 \times 10^9 = 686 \text{ mg/100 mL} \rightarrow \text{normal}$   
 $RBC: 4.5 \times 10^{12} = 11.25 \text{ mg/dL} \rightarrow \text{normal}$   
 $PLT: 150 \times 10^9 = 68.75 \text{ mg/dL} \rightarrow \text{normal}$

## Automated Solution



Manual calculations take considerable time and are prone to error.

Report is ready after 30 seconds of data entry. Correct diagnosis of elevated calcium excretion is readily apparent. Total volume is normal.

Adult-oriented report provided by commercial lab cannot be interpreted in pediatric patient. Report notes "There are no pediatric normal values established for this laboratory." Report incorrectly suggests calcium excretion is normal and total volume is low.