

Optimal use of laboratory tests Direct Bilirubin

TARGET USERS

Health professionals involved in ordering laboratory tests.

OBJECTIVE OF THE TOOL

To support health professionals in the judicious use of clinical laboratory testing.

This clinical tool is provided for informational purposes only and does not replace the clinician's judgment in the exercise of activities reserved to them by law and regulation.

❌ DIRECT BILIRUBIN TESTING IS NOT INDICATED:

→ following a normal total serum bilirubin result.

Repeating direct bilirubin testing **is not routinely indicated:**

→ in individuals with Gilbert's syndrome with chronic hyperbilirubinemia, even if total serum bilirubin remains elevated.

INDICATIONS FOR DIRECT BILIRUBIN TESTING

Direct bilirubin testing **may be indicated** when total serum bilirubin is elevated:

- in newborns of gestational age ≥ 35 weeks who are:
 - jaundiced < 24 hours old, or
 - experiencing persistent jaundice^{1,2}.
- In children and adults who are:
 - jaundiced; or
 - under evaluation or follow-up for cholestasis.

1. Persistent jaundice:

- newborn ≥ 14 days of age fed with infant formula;
- newborn ≥ 21 days old and breastfed.

2. See INESSS **National Medical Protocol** (No. 888036) for detailed guidance on measuring and monitoring total serum bilirubin in a newborn with suspected neonatal jaundice.

OTHER CONSIDERATIONS

- Automation (e.g., reflex algorithm-based testing) of direct bilirubin testing in the presence of an abnormal total serum bilirubin result, while still allowing total serum bilirubin to be measured alone (e.g., in Gilbert syndrome), may:
 - reduce unnecessary direct bilirubin tests;
 - improve efficiency of patient management.
- In neonatology, in specific clinical situations, it may be necessary to measure direct bilirubin without waiting for the results of the total serum bilirubin measurement.

RELEVANCE ISSUES

- Direct bilirubin testing is not clinically indicated without a preceding total serum bilirubin test and is only meaningful in patients with an abnormally elevated total serum bilirubin level.

INFORMATION ON THE TEST

- Total bilirubin is composed of indirect (unconjugated) bilirubin and direct bilirubin (conjugated and delta bilirubin).
- Reference thresholds for direct bilirubin can vary across clinical practice guidelines and laboratory testing platforms.

EPIDEMIOLOGICAL DATA

Incidence of Neonatal Cholestasis

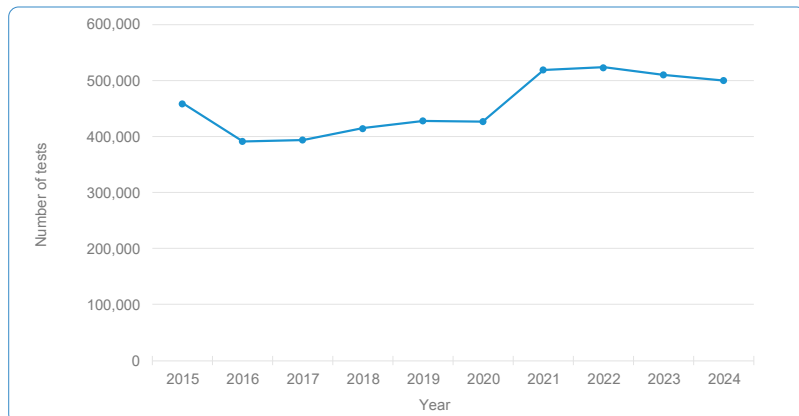
Newborns
1 in 2,500

Incidence of Biliary Atresia in Canada

Newborns
1 in 19,000

ADDITIONAL CONSIDERATIONS

Evolution of the number of tests performed in Quebec between 2015 and 2024



↑ **9.0%**

Increase in the number of tests performed between 2015 and 2024



\$0.60 / test (2024)*

In 2024, **500,372** direct bilirubin tests were performed in Quebec.

These tests represent an estimated cost of **\$300,000** for the same period.

* The cost reflects a weighted value that accounts for the human and material resources required to perform the test. It excludes costs related to infrastructure and clinical and medical staff salaries. For more details, see the [methodology](#).



Avoiding ordering low-value laboratory tests helps **optimize** the use of **human resources within the healthcare system**, **while also reducing the carbon footprint** by:

- Reducing the use of medical supplies
- Reducing energy consumption
- Limiting patient travel

Based on a life cycle assessment conducted in a Canadian context (British Columbia), the carbon footprint of a single direct bilirubin test (excluding phlebotomy) is estimated at **56.7 g CO₂e**. This corresponds to more than 28 metric tons of CO₂e for the **500,372** direct bilirubin tests performed in Québec in 2024, equivalent to the emissions of **518** gasoline-powered cars traveling from Montréal to Québec City.

The recommendations were developed using a systematic approach and are supported by the scientific literature as well as the knowledge and experience of Quebec clinicians from diverse specialties and areas of expertise. For more details, see insss.qc.ca.

For more details, including references, refer to the [associated report](#).

For any questions relating to clinical tools, write to info-outils.cliniques@insss.qc.ca.

